

SYSTEM BUCKYDIAGNOST FS

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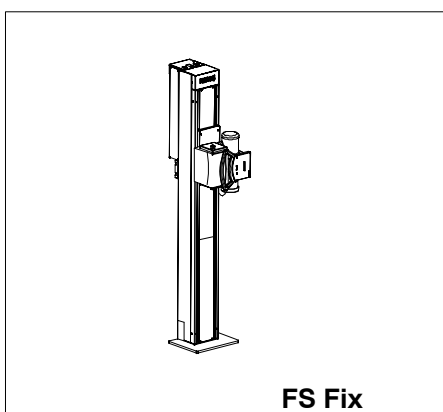
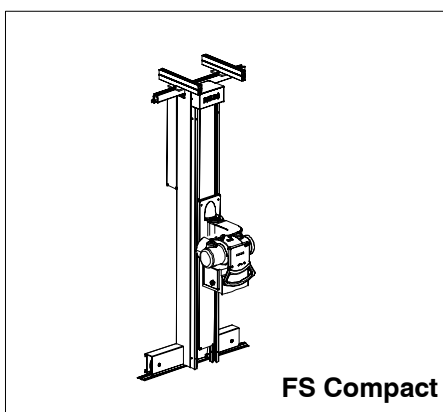
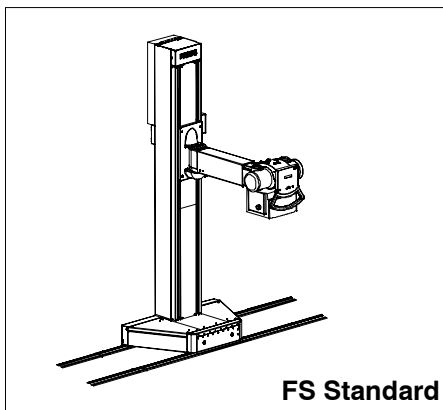
- ⊗ SUBSYSTEM MANUAL BuckyDiagnost FS
- UNIT MANUAL manual/automatic collimator

Note: ⊗ indicates document present

**SERVICE MANUAL
704
SUBSYSTEM**

BuckyDiagnost FS

9890 010 83651



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SERVICE MANUAL - SUBSYSTEM**BuckyDiagnost FS**

Author: M. Bierstedt

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In case there are any questions concerning this manual,
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Introduction and technical data

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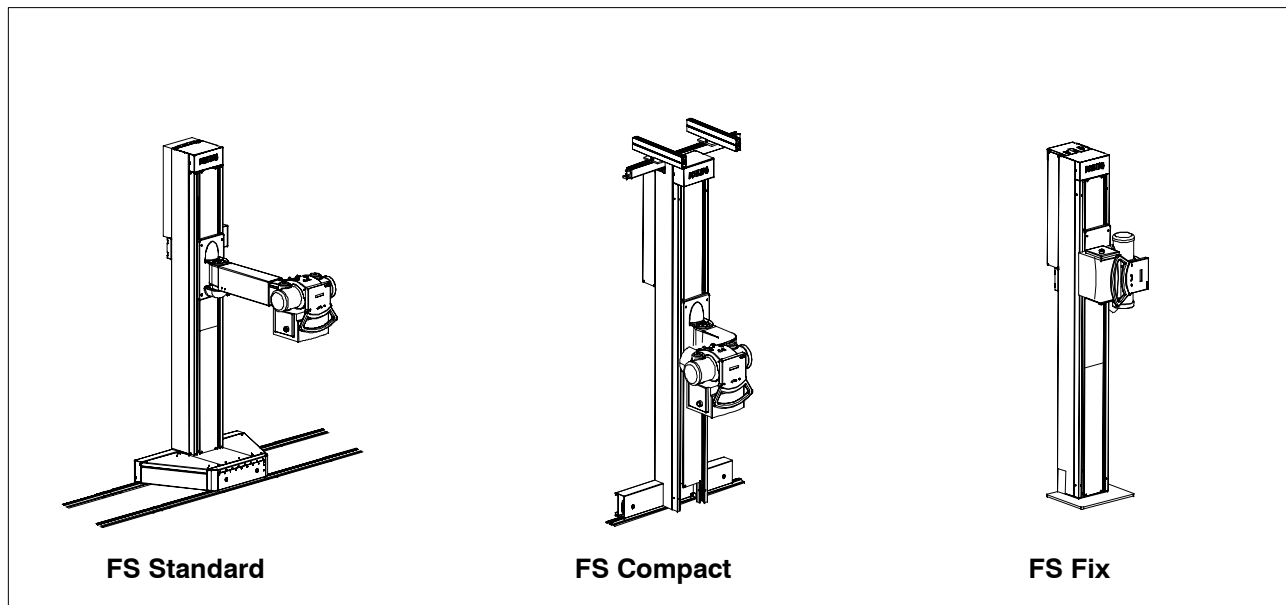
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1. Introduction and technical data

1.1. Purpose of the manual

This documentation is valid for BuckyDiagnost FS (floor stand).

The floor stand is part of the BuckyDiagnost family.



The FS has a modular design and comes in three different versions:

- Standard design with full scalability and the only FS with tomography option.
- Compact solution for small rooms.
- Fix column as a dedicated system, e.g. for chest rooms with the column fixed to the floor.

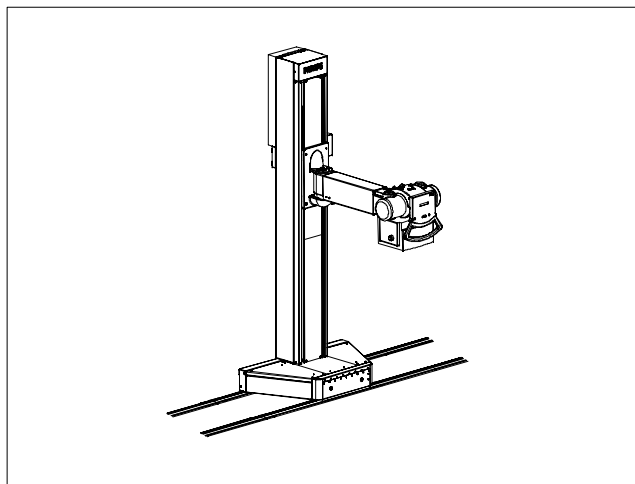
1.2. Items supplied

FS Standard

- Column with weight counter-balanced holder for X-ray tube assembly
- Long tube carrier arm
- Control handle
- Manual collimator with light
- Rail system, floor mounted
- High-voltage cable, length depending on questionnaire
- Installation cable, length depending on questionnaire

Options:

- Long tube carrier arm, extendable
- Rail extension 1370 mm
- Automatic collimation and cassette size sensing
- Tomography
- Tracking

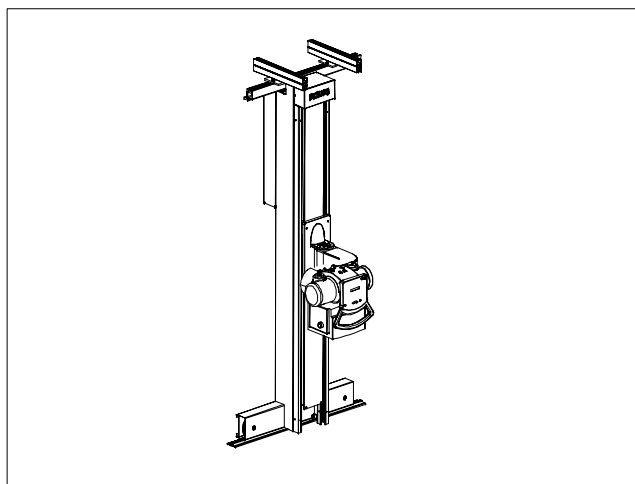


FS Compact

- Column with weight counter-balanced holder for X-ray tube assembly
- L-shaped tube carrier arm
- Control handle
- Manual collimator with light
- Rail system, floor and ceiling/ wall mounted
- High-voltage cable, length depending on questionnaire
- Installation cable, length depending on questionnaire

Options:

- Automatic collimation and cassette size sensing
- Tracking

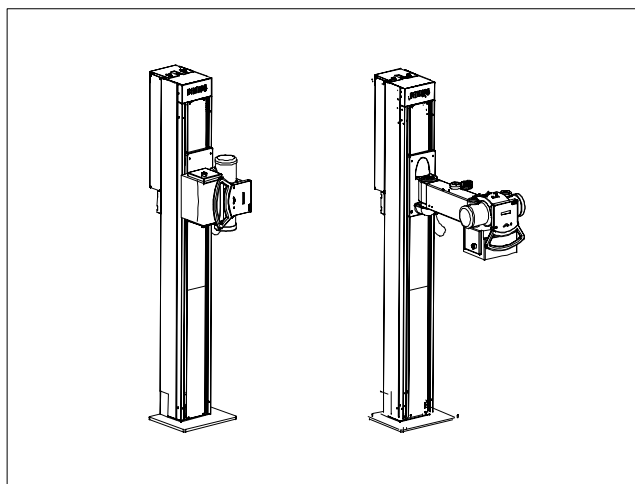


FS Fix

- Column with weight counter-balanced holder for X-ray tube assembly
- Short tube carrier arm
- Control handle
- Automatic collimation and cassette size sensing
- High-voltage cable, length depending on questionnaire
- Installation cable, length depending on questionnaire

Options:

- Long tube carrier arm
- Tracking



1.3. Compatibility

The **BuckyDiagnost FS** is compatible with the following components:

- Control handle basic
- Control handle basic SID
- Control handle options
- Control handle options SID
- Manual collimator (Ralco)
- Automatic collimator (Nicol)
- RO 1750/ROT 350
- RO 1648/ROT 350
- SRO 0951/ROT 350
- SRO 2250/ROT 350
- SRO 2550/ROT 350
- SRO 33100
- Rail extension 1370 mm
- Set of cables standard (various lengths)
- Set of cables options (various lengths)
- Set of parts for non-sensing
- Set of parts for sensing
- Set for cassette size sensing
- Set for option tomo (FS Standard only)
- Set for option tracking

Compatibility with other subsystems:

- Generator OPTIMUS 50/65/80
- Generator OPTIMUS 30 single phase
- BuckyDiagnost VE/VT
- BuckyDiagnost VE/VT (V2 with ACL4)
- BuckyDiagnost TH family

For information refer to PMS catalogue, section 704/720.

1.4. Technical data

1.4.1. Mechanical data

For information about mechanical data refer to chapter Z 'Drawings' and PRD 'Product planning BuckyDiagnost FS' .

1.4.2. Environmental data

	Operation	Stock / Transport
Temperature in ° Celcius	0 / + 40	- 40 / + 75
Temperature in ° Celcius / Hour	N/A	N/A
Humidity in % (non-condensing)	5 / 95	5 / 95
Gradient in % / hour	N/A	N/A
Vibrations / Shock range in Hz	5 – 500	5 – 500
Vibrations / Shock amplitude in mm	N/A	N/A
Vibrations / Shock acceleration in g	0.25 peak	1.0 peak
Shock acceleration in g	5 peak	10 peak
Shock pulse duration in msec	11	11
Air pressure in Hecto-pascal	700 / 1100	700 / 1100

Acoustic noise level : N/A
 Air cooling : N/A
 EMC : IEC 950

1.4.3. Electrical data**Equipment related:**

Power required : max. 600 VA
 Nominal voltages : 230 VAC
 Supply configurations : 230 VAC
 Voltage variation : N/A
 Voltage impulse : N/A
 Voltage surge : N/A
 Voltage sag : N/A
 Static frequency variation : 50 or 60 Hz ± 1 Hz
 Dynamic frequency variation : N/A
 Harmonic voltage distortion : N/A
 (single, total)
 Neutral to ground voltage variation : N/A
 Neutral to ground voltage impulse : N/A
 Nominal current : standby (50/ 60 Hz) 0.5/ 0.6 A
 maximum current (50/ 60 Hz) 2.3 / 2.6 A
 Nominal frequency : 50 Hz / 60 Hz
 Heat emission
 standby : N/A
 in operation : N/A

Operating voltages:

- 230 VAC +10 ... 15%

1.4.4. Tools / Material required**1.4.4.1. FS Standard****Tools****Pre-installation**

Delivered	:	N/A
To be ordered	:	N/A
To be arranged locally	:	<ul style="list-style-type: none"> - TC 129, tool kit, standard - TC 153, digital spirit level - Power tools (hammer drill with carbide drills) - Measuring tape 10 m

Installation

Delivered	:	- FS standard column insertion tool 4512-000-4063x
To be ordered	:	N/A
To be arranged locally	:	<ul style="list-style-type: none"> - TC 129, tool kit, standard - TC 153, digital spirit level - TC 092, notebook, service PC - TC 003, service PC cable kit - TC 091, multimeter - Service software X-Scope 1.4.2 or higher - Power tools (hammer drill with carbide drills) - Measuring tape 10 m

Material:**Pre-installation**

Delivered	:	N/A
To be ordered	:	Foundation frame set for floor rails recommended: 3920 mm 4512-131-8775x 1370 mm extension 4512-131-8781x
To be arranged locally	:	N/A

Installation

Delivered	:	Depending on questionnaire the following parts are delivered: <ul style="list-style-type: none"> - 2x Floor rails 2550 mm 4512-201-0214x - 2x Floor rails 1370 mm 4512-201-0215x - 2x Option floor rail extension 1370 mm 4512-201-0215x - 4x Support bar 1960 mm 4512-131-8774x - 2x Option support bar extension 1370 mm 4512-131-8779x - 0.5/1.0/1.5 mm thick balance plates - 2x Tomo rails 1880 mm (delivered with option tomo) 4512-133-06251 - 1x Option tomo rail extension 1370 mm 4512-201-0187x
To be ordered	:	N/A
To be arranged locally	:	<ul style="list-style-type: none"> - Fixing material for the floor rails - Fixing material for the tomo rail

1.4.4.2. FS Compact**Tools****Pre-installation**

Delivered	:	N/A
To be ordered	:	N/A
To be arranged locally	:	<ul style="list-style-type: none"> - TC 129, tool kit, standard - TC 153, digital spirit level - Power tools (hammer drill with carbide drills) - Measuring tape, 10 m

Installation

Delivered	:	N/A
To be ordered	:	N/A
To be arranged locally	:	<ul style="list-style-type: none"> - TC 129, tool kit, standard - TC 153, digital spirit level - TC 092, notebook, service PC - TC 003, service PC cable kit - TC 091, multimeter - Service software X-Scope 1.4.2 or higher - Power tools (hammer drill with carbide drills) - Measuring tape, 10 m

Material**Pre-installation**

Delivered	:	N/A
To be ordered	:	N/A
To be arranged locally	:	For ceiling heights 2400 mm ... 3400 mm different guide rail holders are available for ceiling installation via the commercial catalogue. For ceiling heights >3400 mm an additional anchor rail construction is necessary.

Installation

Delivered	:	Depending on the questionnaire the following parts are delivered:
		1x Floor rails 2550 mm 4512-201-0214x
		1x Floor rails 1370 mm 4512-201-0215x
		- 0.5/1.0/1.5 mm thick balance plates
		1x Option floor rail extension 4512-201-0215x
		1x Support bar 1960 mm 4512-131-8774x
		1x Option support bar extension 4512-131-8779x
		1x Guide rail 4000 mm 4512-201-0217x
		1x Guide rail 4000 mm for extension 4512-201-0217x
		(to be cut to length locally)
		Wall mounted guide rail holder: 4512 201 0213x
		3x Holders needed for a total length of 3920 mm
		5x Holders needed for a total length of 5290 mm
		Ceiling mounted guide rail holder:
		3x guide rail holders for total rail length of 4000 mm
		Guide rail holder for room height 2490 ... 2590 mm 4512-201-0218x
		Guide rail holder for room height 2590 ... 2800 mm . 4512-201-0219x
		Guide rail holder for room height 2800 ... 3400 mm . 4512-201-0220x
To be ordered	:	N/A
To be arranged locally	:	For ceiling heights >3400 mm an additional anchor rail construction is necessary.
		- Fixing material for floor rails

1.4.4.3. FS Fix**Tools****Pre-installation**

Delivered	:	N/A
To be ordered	:	N/A
To be arranged locally	:	<ul style="list-style-type: none"> - TC 129, tool kit, standard - TC 153, digital spirit level - Power tools (hammer drill with carbide drills) - Measuring tape, 10 m

Installation

Delivered	:	Fixing material included
To be ordered	:	N/A
To be arranged locally	:	<ul style="list-style-type: none"> - TC 129, tool kit, standard - TC 153, digital spirit level - TC 092, notebook, service PC - TC 003, service PC cable kit - TC 091, multimeter - Service software X-Scope 1.4.2 or higher - Power tools (hammer drill with carbide drills) - Measuring tape, 10 m

Material**Pre-installation**

Delivered	:	N/A
To be ordered	:	N/A
To be arranged locally	:	N/A

Installation

Delivered	:	Fixing material included
To be ordered	:	N/A
To be arranged locally	:	N/A

1.4.5. Network data

N/A

1.4.6. Remote service data

N/A

1.4.7. Transport data

For information about transport data refer to the corresponding PRD.

1.4.8. Pre-installation requirements

It is supposed that the pre-installation includes all work to allow the mechanical and electrical installation of the shipped subsystem and components at once.

- The cable ducts and cable conduits are installed already and have the required dimensions.
- A foundation frame (steel plate) for the fix column is installed (to be supplied locally).
- Foundation frames for rails are installed (recommended).
- The doorways must be sufficient to pass through with the boxes.

For further information refer to:

Room layout plan (see PRD 'System planning BuckyDiagnost FS).

The preliminary planning work is restricted to the selection of the suitable room. The layout of the room with the conduits and pipes required are shown in the PRD 'System planning' for BuckyDiagnost.

1.4.9. Movements

- Longitudinal movement:
2840 mm (standard rails) (FS Standard, FS Compact)
4210 mm (with rail extension) (FS Standard, FS Compact)
- Transverse movement:
FS telescopic arm 150 mm (FS Standard)
- Vertical movement:
400 ... 2000 mm (FS Standard, FS Compact, FS Fix)

1.4.10. Pre-installation data

For information about the pre-installation data refer to PRD 'Product planning' BuckyDiagnost FS.

1.5. Safety information

The general legal and factory safety recommendations for this X-ray equipment and the following recommendations must be strictly observed!

Start of installation, operation and maintenance work and especially electrical work must only be executed by trained and authorized persons. This equipment must only be serviced by properly educated service specialists who have received general and system-specific training as performed by Philips Medical Systems.

**Warning!**

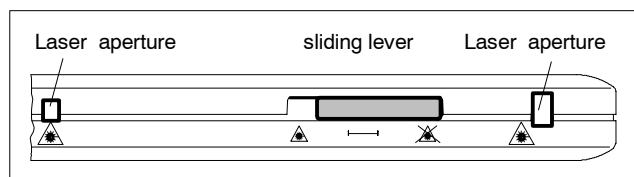
The system/component must be switched OFF during replacement work. Any X-ray unit produces ionizing radiation which may be harmful if not properly controlled. Therefore, it is recommended that this equipment be operated in accordance with the guidelines set down by the national council on radiation protection.

**Warning!**

The light source of the light pointer is a Class II laser. Never look into the beam directly.

With Class II lasers the eye is protected from brief, random glances into the laser beam by the eyelid closure reflex. Class II lasers may therefore be used without taking any further precautions provided it is necessary neither to intentionally look into the beam for a period longer than 0.25 s nor to repeatedly look into the laser beam or directly reflected laser beam.

For continuous duty Class II lasers the maximum limit for accessible radiation is 1mW. The laser light is emitted from openings in the lower side of the controlhandle. The laser apertures are marked by the yellow/black laser triangle in close proximity to the laser aperture.



1.6. Compliance information

N/A

1.7. Equipment identification and labeling

Refer to drawing 2Z-10.

1.8. Abbreviations and definitions

Abbreviation	Explanation
BIST	Build-In Self Test
SID	Source Image Distance
FS	Floor Stand
PMS	Philips Medical Systems
POST	Power-On Self Test
PRD	Product Reference Data
RO	Rotalix
SID	Source Image Distance
SRO	Super Rotalix
TC	Tool Code
TF	Table Fixed
TH	Table Height adjustable
VE	Vertical
VR	Vertical Radiography
VT	Vertical Tilttable

1.9. Manual history

Date	Version	Name	Reason of changes
25.04.04	1.0	M. Hasche	
27.01.2005	1 REV AF	M. Bierstedt	Section 7: ACCEPTANCE

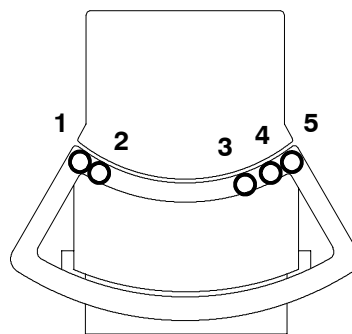
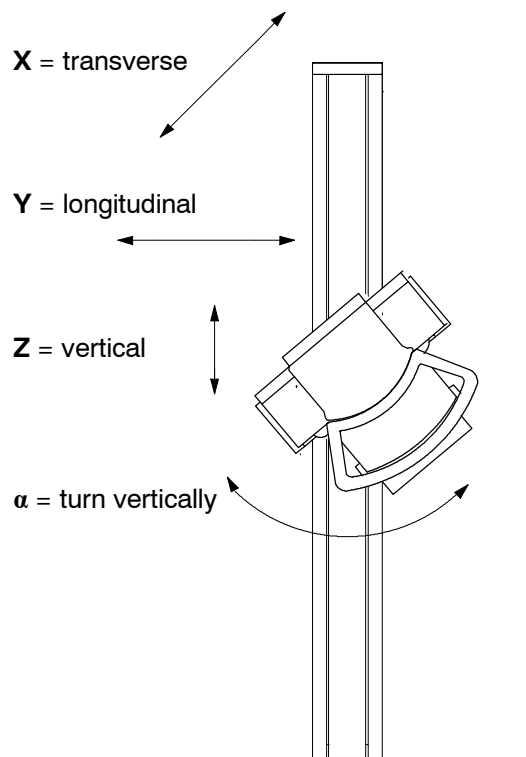
Installation

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1. Convention of coordinate system



- 1 **X** = transverse, blue mark
- 2 **Y** = longitudinal, green mark
- 3 **β** = turn horizontal, violet mark
- 4 **Z** = vertical, yellow mark
- 5 **α** = turn vertically, black mark

2. Introduction, tools, room check

Before starting the installation check that the tools are available and the pre-installation room requirements are fulfilled (refer to PRD BuckyDiagnost FS).

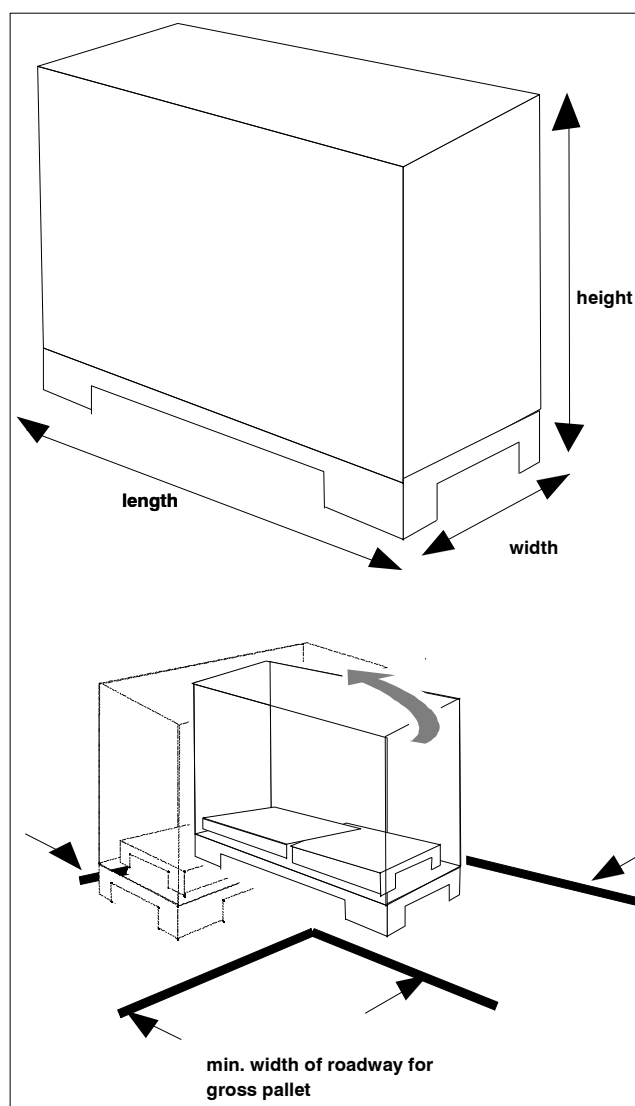
3. Unpack, transport

3.1. Box dimensions

Crate / Box FS Standard	Dimension [mm]			Weight [kg]
	Length/ Depth	Width	Height	
Packed	2800	960	1720	650
Installed	1370... 1520	1000	2411	350 max.

Crate / Box FS Compact	Dimension [mm]			Weight [kg]
	Length/ Depth	Width	Height	
Packed	2800	960	1720	600
Installed	1130	1000	2390	330 max.

Crate / Box FS Fix	Dimension [mm]			Weight [kg]
	Length/ Depth	Width	Height	
Packed	2800	960	1720	570
Installed	789... 1552	642	2386	310 max.



3.2. Roadway

Minimum roadway width for box is defined in PRD 'Product planning data' 'Mechanical data'.

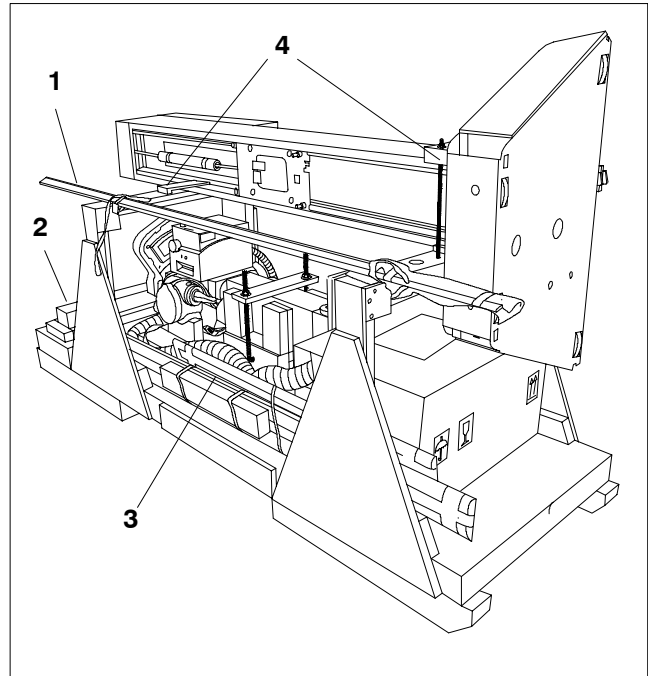
3.3. Unpacking

The following procedure should be performed by four persons.

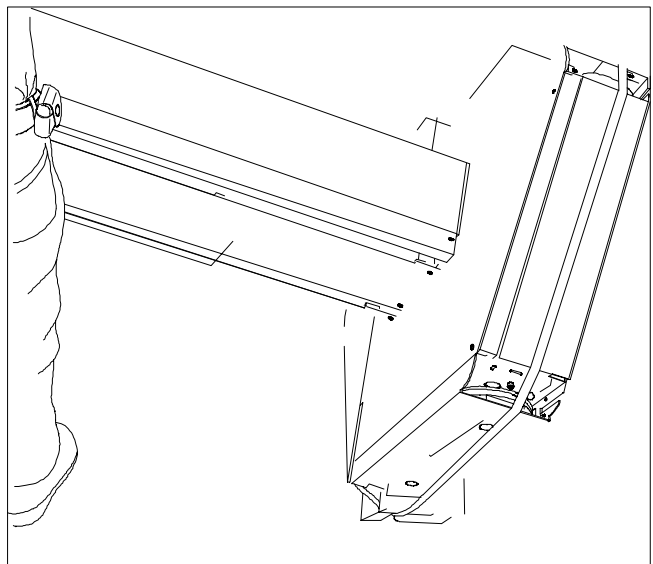
FS Standard



- Dismantle the box and remove the foil.
- Remove the rails (1) from the pallet.
- Remove the counterweights (2).
- Remove the set of covers and the rail distance tool (3).
- Remove the transport locking (4).

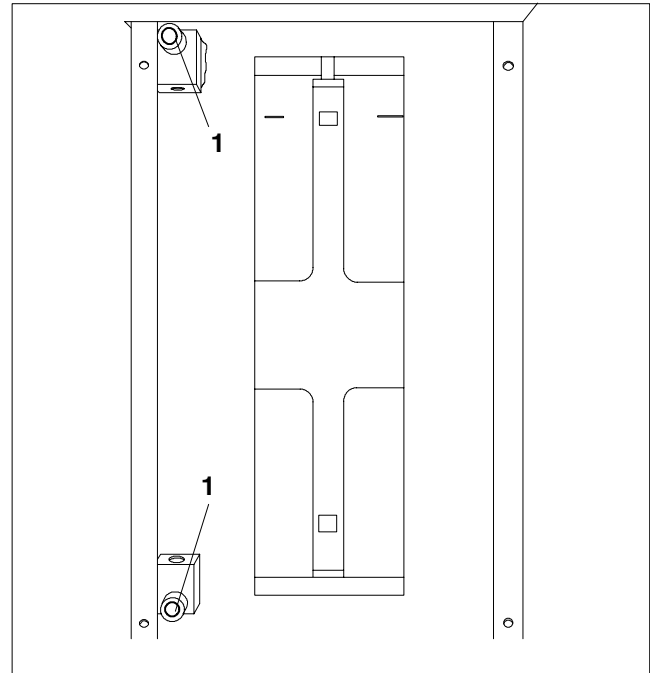


- Pull the column at its bottom and tilt it over the edge of the transport pallet.
- Lift the column.

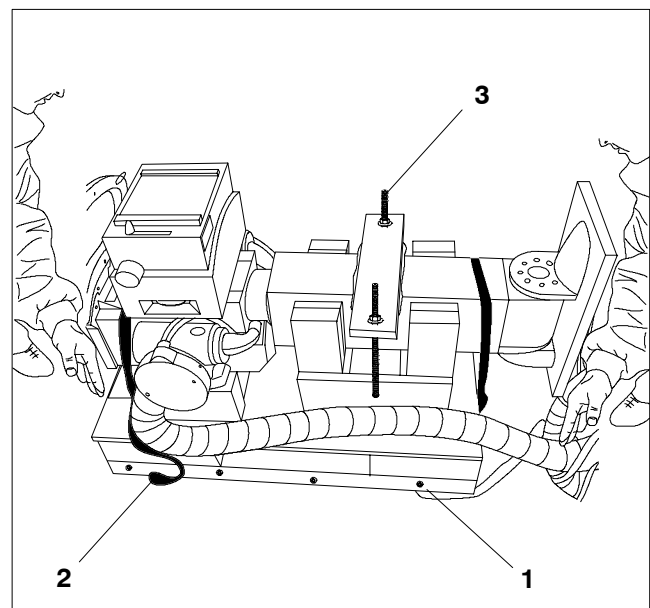




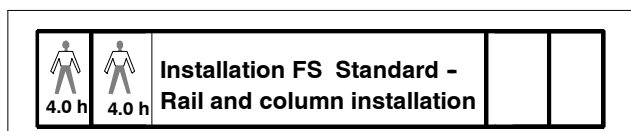
Warning!
The counterweight carriage must be left secured with screws (1) until counterweights and tube arm are completely installed!



- Remove the screws (1) (8 x).
- Remove the tube assembly pallet and box with cables. Use the straps (2).
- Remove the transport locking (3).



4. Installation of FS Standard

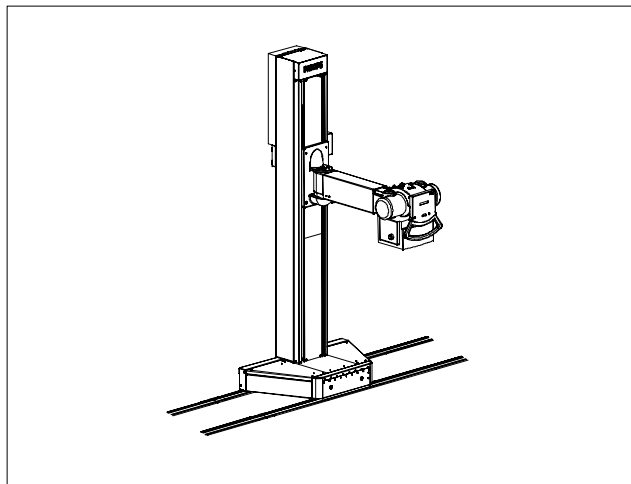


4.1. Installation of the floor rails

Note

Before starting the installation of the rails, check the local planning room drawing and PRD for rail layout.
Distance between the rails: 500 mm

The rails are delivered in a set with two different lengths (1370, 2550 mm). The long rail is always used at the table side.



4.1.1. Accuracy requirements

Caution!

For a good performance of the system it is important to align the front and rear rail very precisely!

Floor level accuracy requirements:

In the area of the rail installation the floor has to be leveled within 2.0mm

Rail level accuracy requirements:

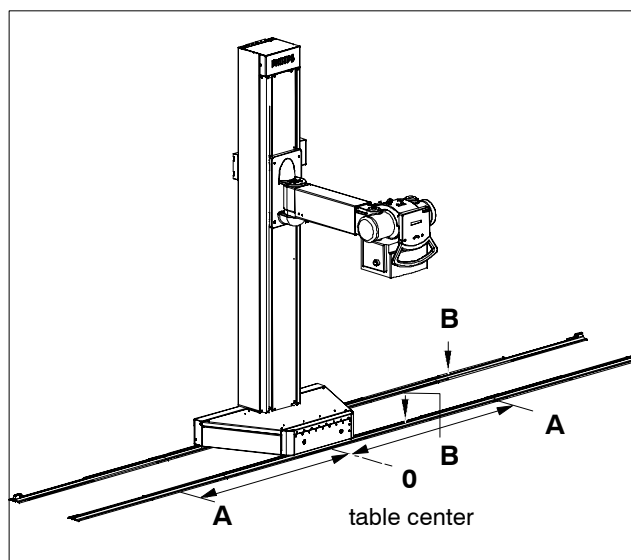
A = distance between table center and right/left side

B = tolerance for parallelism and evenness of the two floor rails.

Non tomo systems: A = 1000mm
B = less or equal 1.0mm

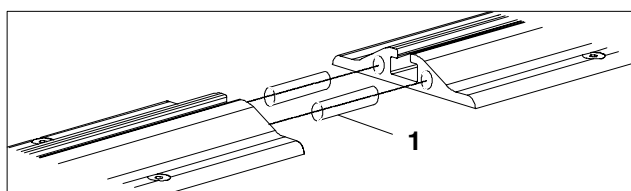
Tomo systems: A = 1200mm
B = less or equal 0.5mm

In the remaining area the floor has to be leveled within 2.0mm.



4.1.2. Preparation of the floor rails

- Insert the pins (1) in the holes in the rail and connect the rails.



4.2. Installation of the rails

Caution

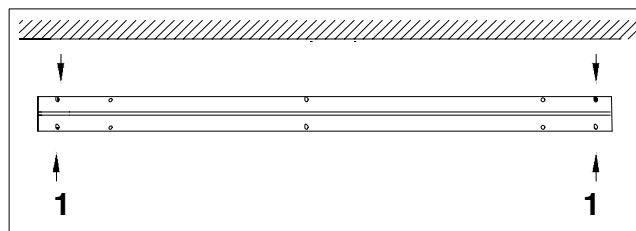
Use adequate fixing material depending on the ground. Fixing material has to be obtained locally!

4.2.1. Installation of the first rail

Note

To ensure that the drilling holes fit, proceed as described below.

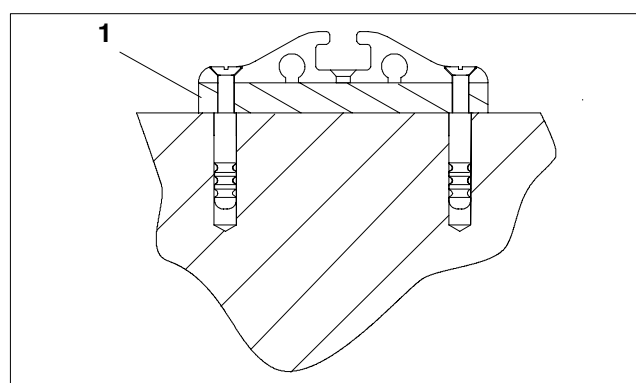
- Determine and mark the drilling holes (1).
 - Use the outer rail holes as a drilling template for the first (rear) rail.
- Drill the outer holes depending on the fixing material.
- Place the dowels and fix the rail.
- Use all other holes in the rail as a drilling template.
- First drill max. 5 mm holes in order not to damage the rail.
- Remove the rail.
- Drill the holes to final dimensions depending on the fixing material.
- Place the dowels and fix the rail.



Additional rail support bar for option tomography

Use the delivered support bar for systems with option tomography.

- Place the support bar (1) between rail and floor to achieve better stability.



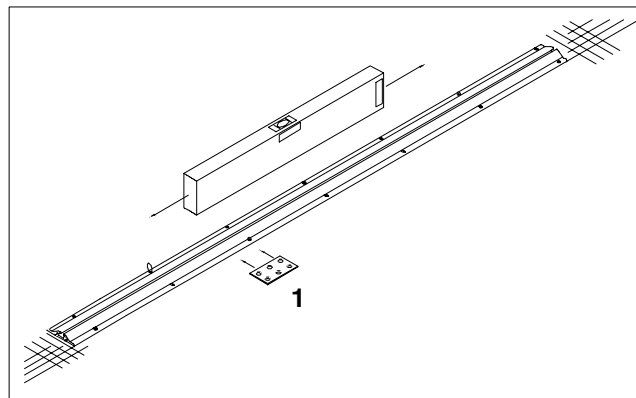
4.2.2. Height alignment of the first rail

Note

In case of an uneven floor, linings have to be used to achieve the required height accuracy!

The linings (1) are delivered in different thickness!

- Loosen the rail and position the balance plate between floor and rail.
- Use the spirit level to check the alignment.

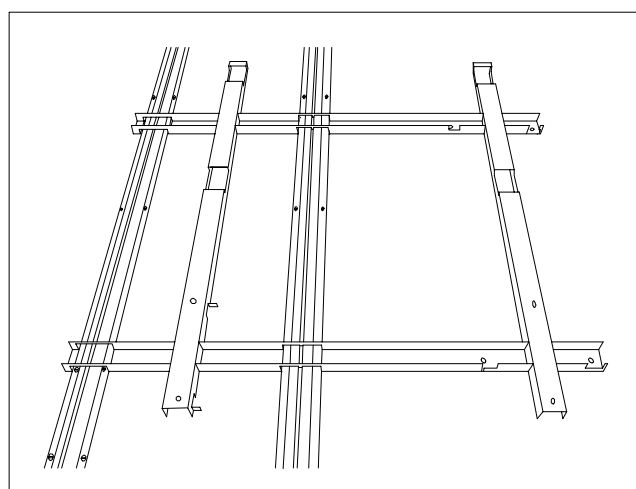


4.2.3. Installation of the second rail

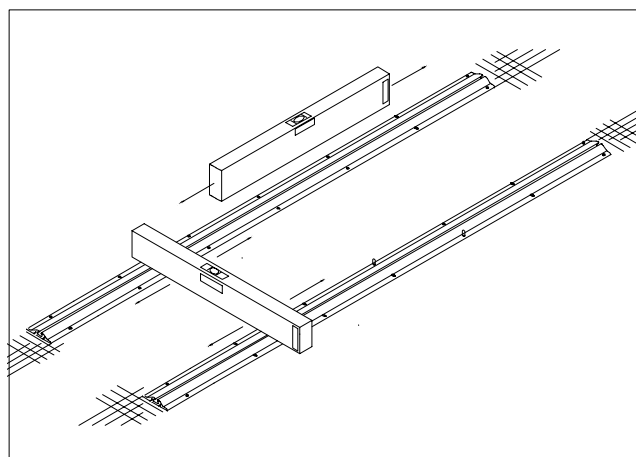
Note

The second rail can be aligned using the delivered rail distance tool. The tool can also be used as template for the fixing points of the table.

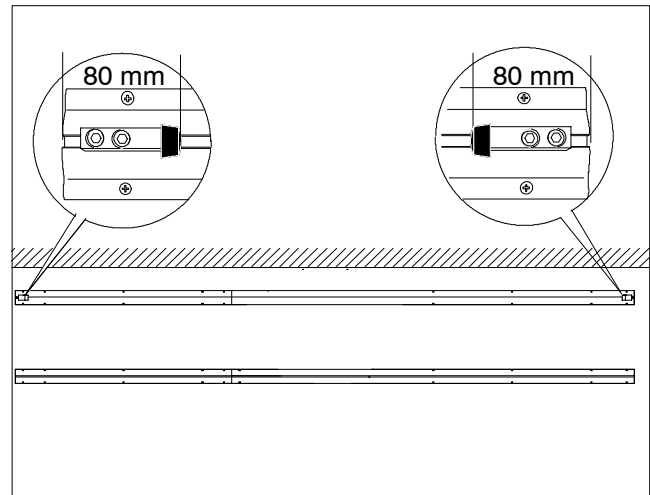
- Place the second rail at the corresponding position.
- Connect the four parts of the tool and place it on the rails according to the figure.



- Use the spirit level to check the alignment.
- Follow the same procedure for fixing and aligning the second rail as described for the first rail.



- Install left and right end stoppers according to the figure.



Option tomography:

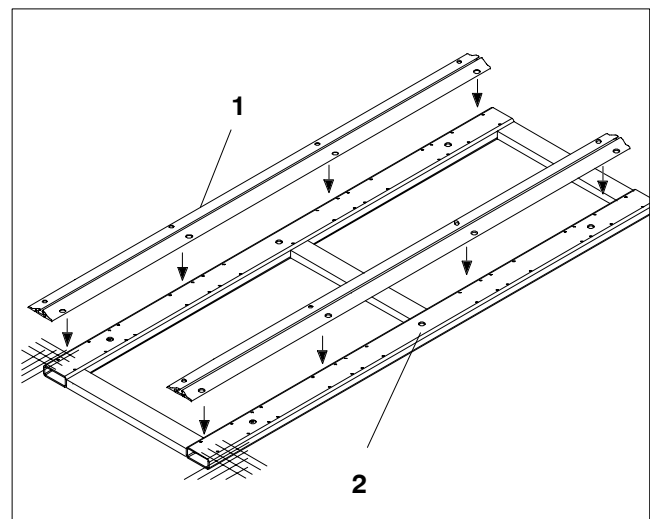
For the installation of the tomo rail refer to chapter 11. 'Option tomography'.

4.3. Installation of the rails on foundation frame (optional)

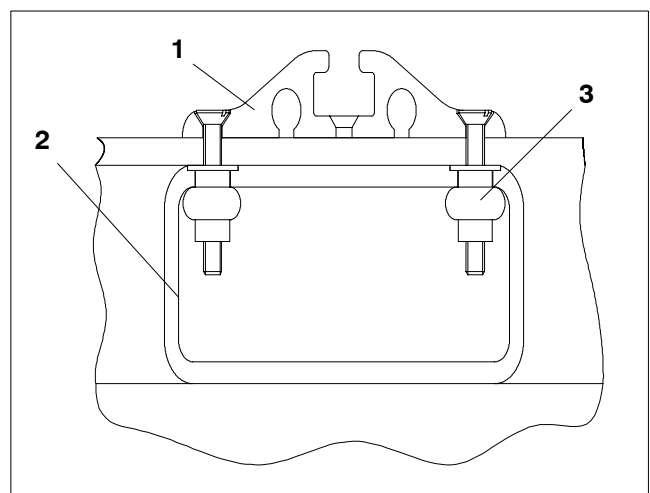
Note

The foundation frame (2) consists of a stable tube construction. After proper installation into the floor it guarantees a leveled underground for the installation of the floor rails. For further information refer to the local planning data and PRD.

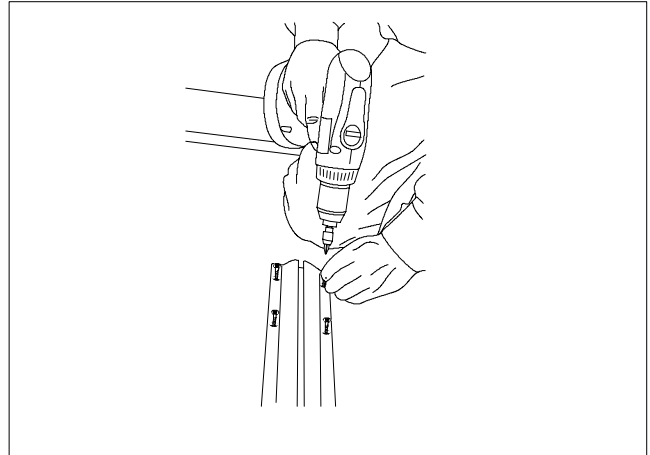
The rails (1) are installed on the top of the foundation frame (2).



- Install the connected rails (1) at the pre-installed foundation frame (2).
- Insert the delivered connecting nuts (3) in the corresponding rail fixation holes.



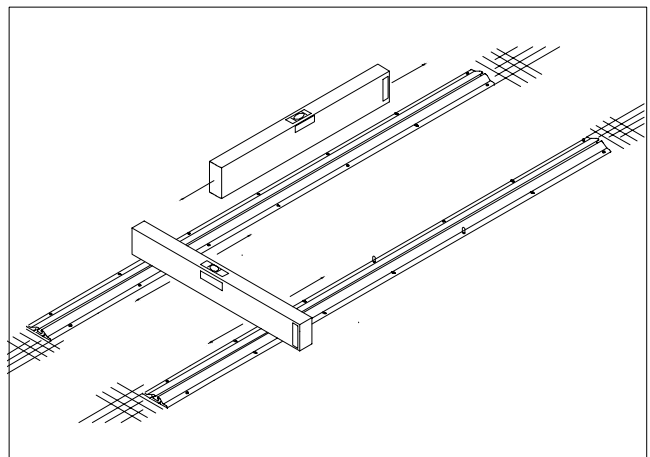
- Fix the rails with the screws.



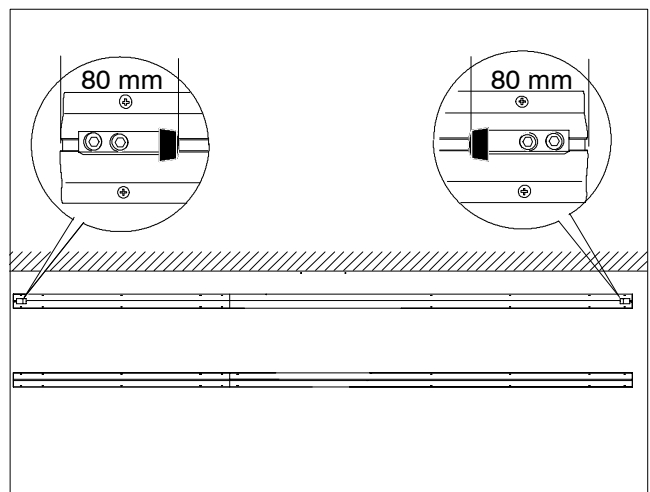
- Use the spirit level to check the accuracy of the rail installation.

Note

If the required accuracy for leveling is not achieved, floor linings with different thickness can be used for compensation.



- Install the left and right end stoppers according to the figure.



4.4. Insertion of the column in the rails

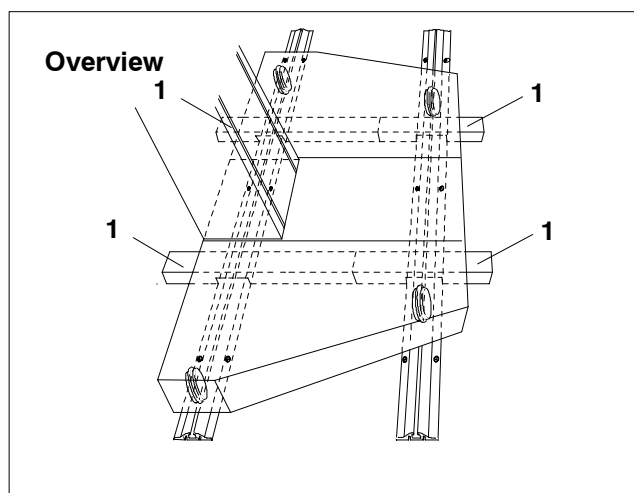
The following procedure should be done by at least two persons!

Caution

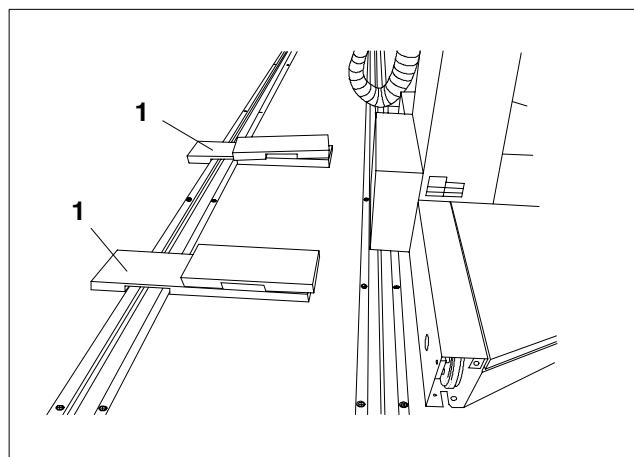
The column has to be inserted in the rails carefully in order not to damage the rollers. Clean the rails before inserting the column!

- Place the column insertion tool consisting of four wooden panels on the rails as shown in the figure.

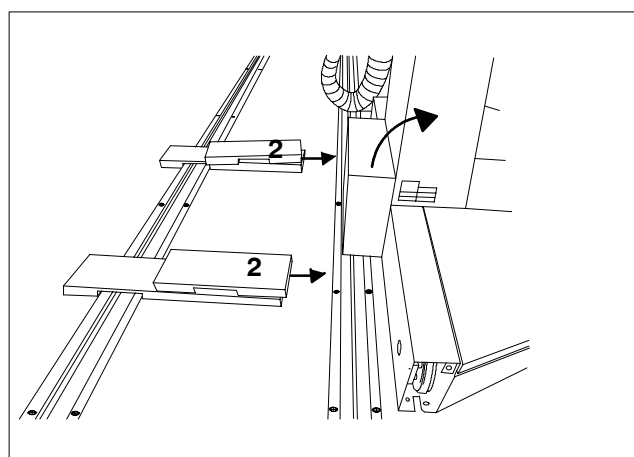
As a result of the following procedure the column should be positioned on the tool as shown in the figure.



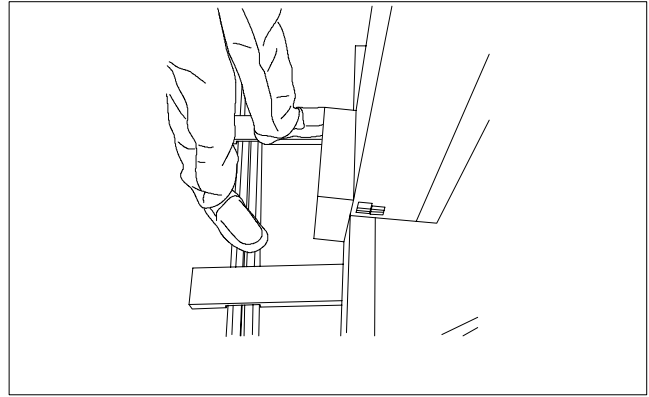
- Place the column parallel in front of the rails.
- Position the long tool (1) on the back rail.



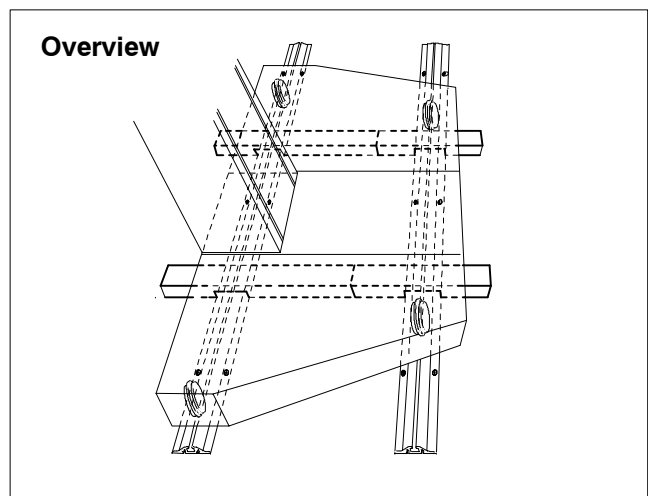
- Tilt the column to the front and position the short tool (2) on the front rail by sliding it under the column base.



- Position the column on the tool and move the column, so that all rollers are aligned parallel to their end position above the rails.



- Check the position of the column.

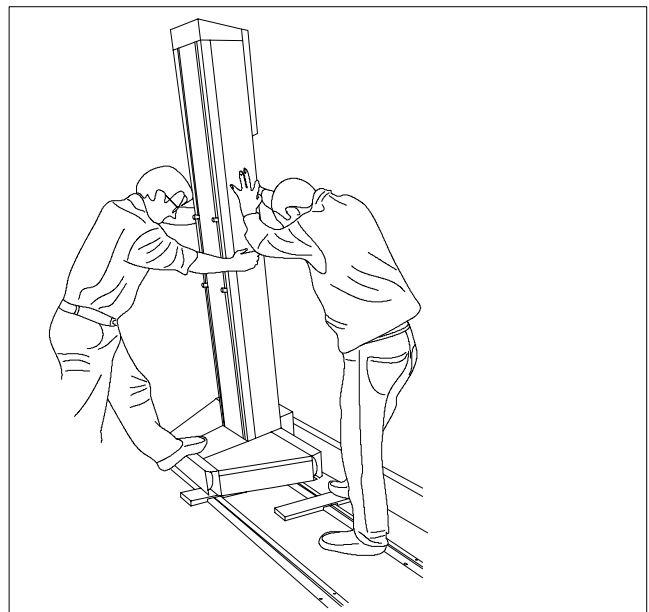


- Tilt the column base to the front and remove the back tools.

Caution

Let the column base down carefully while positioning the rollers into the rails. Do not damage the rollers!

- Tilt the column base to the front and remove the front tools.

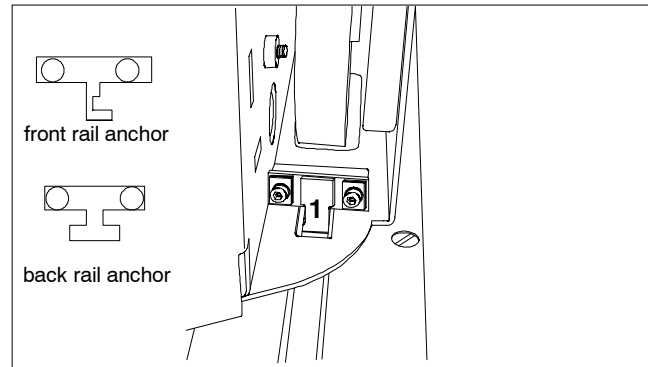


The rail anchors for front and back rails are different.

- Assemble the rail anchors (1) one per roller (pos. 19,20,21,22 in accessories box).

Note

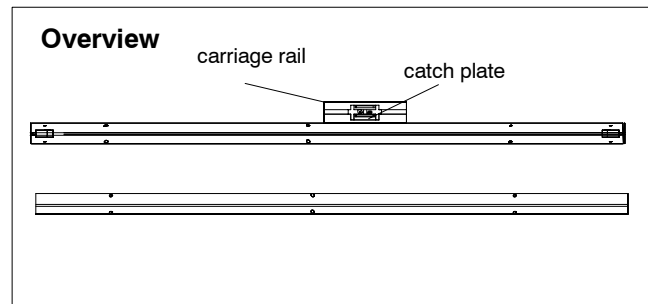
When the rail anchors are assembled, the smooth movement of the carriage over the complete range must be tested. In case the movement is not smooth, the rail anchor has to be repositioned.



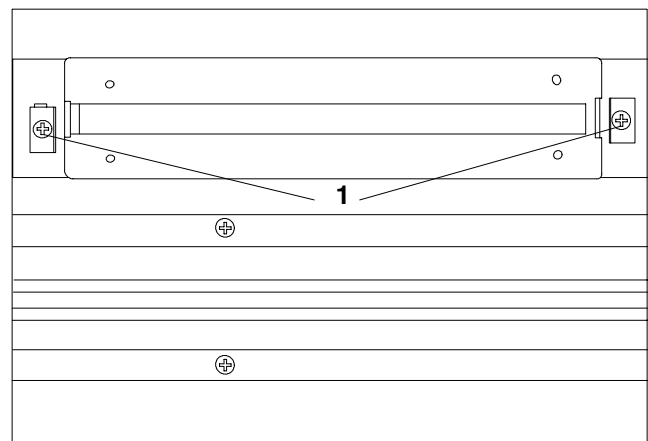
4.5. Installation of the catch plates (FS Standard without option Tomography)

Note

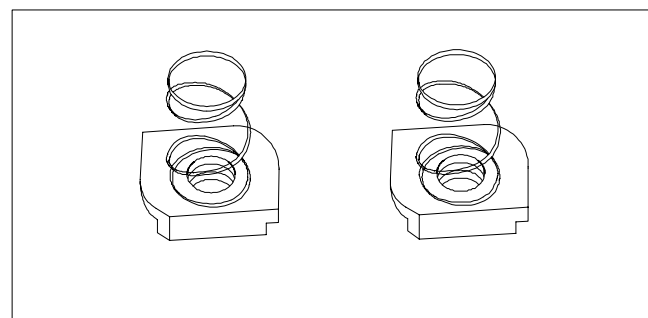
The figure shows an overview of the carriage rail with the catch plate. Depending on the system configuration one or more standard or sensing catch plates (e.g. additional wallstand position) have to be installed. Before starting the installation of the carriage rail, check the local planning room drawing and PRD for position.



- Determine the position of the carriage rail.
- Mark the position of the holes (1) 2x.
- Drill the holes depending on the fixing material.
- Place the dowels and fix the carriage rail.



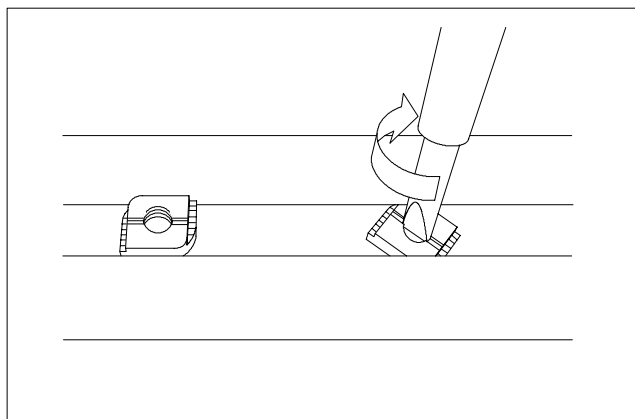
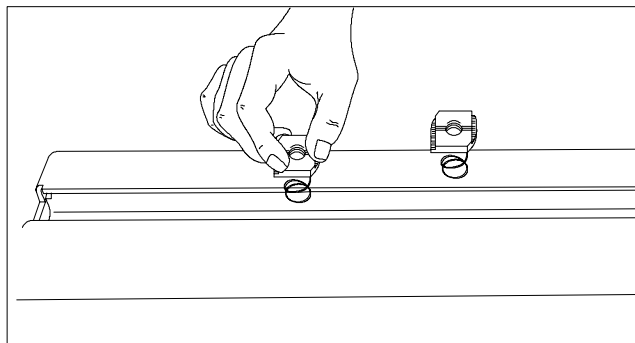
The sliding blocks of the catch plate are modified with a spring at the rear side and a thread at the front side. The new construction makes sure that the catch plate is fixed tightly.



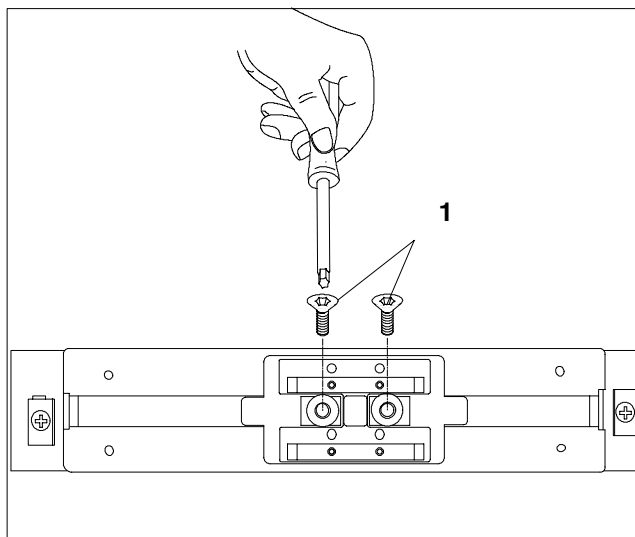
Note

This chapter describes the installation of the catch plate for FS Standard columns without option tomography.

- Install the sliding blocks according to the figures.



- Insert the catch plate in the sliding blocks at the carriage rail and fix the catch plate with screws (1).



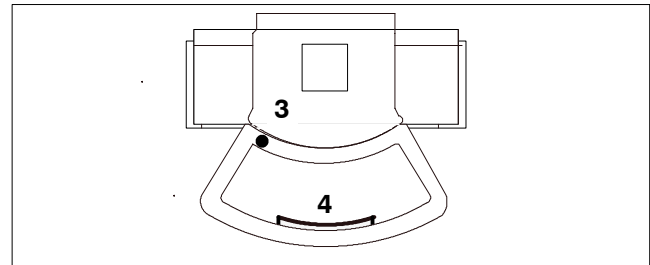
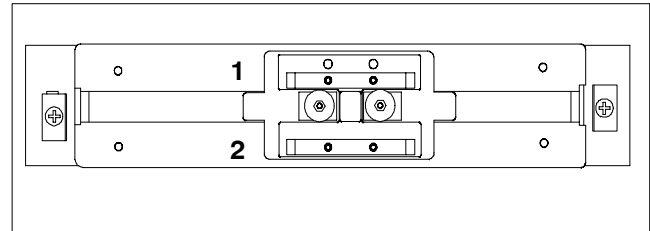
4.5.1. Standard catches

Part of delivery are three standard catch plates.

- Before positioning the catch plates check the function of the ledges.

Actuating cam (1) = active by pressing the brake button (3) (brake is released).

System actuating cam (2) = active by pressing the system brake button (4) (brake is released).



4.5.2. Sensing SID catch plates

For sensing seven lock-in positions can be programmed using switch cams S3 – S6.

The combinations indicate the position of the FS.

With the PC-program X-Scope information of coded plates are stored automatically in the bucky controller memory (refer to manual X-Scope). Each SID-catch plate has to be coded differently.

Note

The installed switch cam S1 guarantees that the column stops in every catch when the release button (1) is pressed. Without S1 the column runs over the catches.

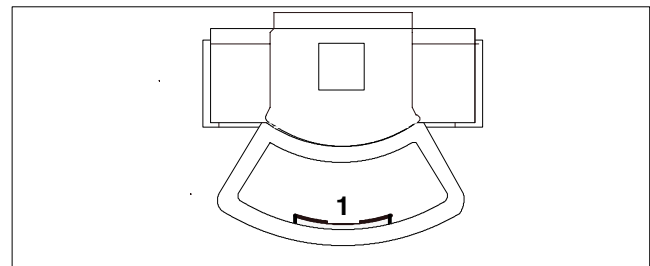
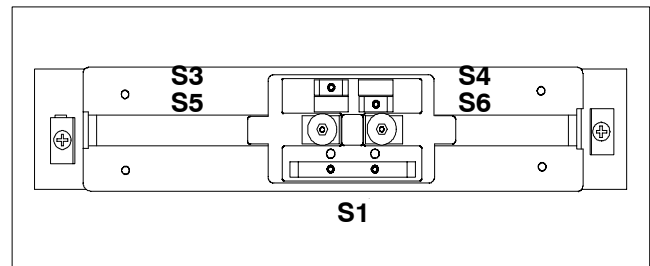


Table: Lock-in positions

Catch	S4	S5	S6	S3
1	0	0	1	1
2	0	1	0	1
3	0	1	1	0
4	1	0	0	1
5	1	0	1	0
6	1	1	0	0
7*	1	1	1	1

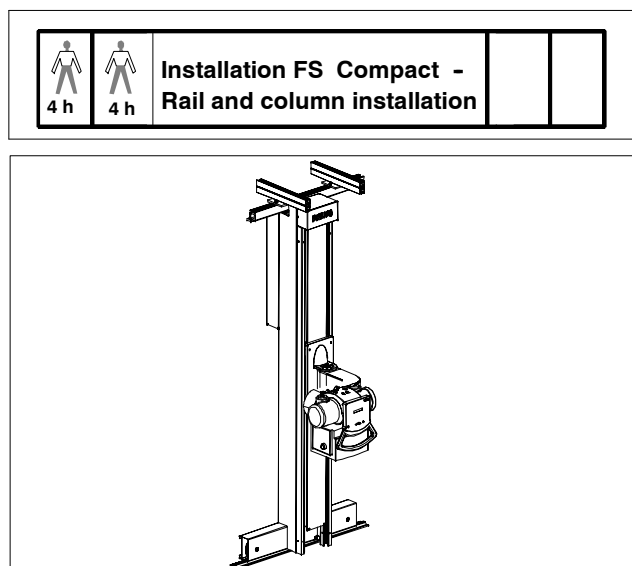
*) Catch 7 is not supplied as standard
"1" = cam provided

4.6. Installation of the catch plate for tomo systems

Refer to chapter 11. 'Option tomography'.

Continue with chapter 7. 'Installation of the tube arm'

5. Installation of FS Compact



5.1. Installation of the rails

Note

Before starting the installation of the floor and ceiling/wall rails check the local planning room drawing and PRD for rail layout!

The floor rail is delivered in a set with two different lengths (1370 mm, 2550 mm). The long rail (2550 mm) is always used at the side of the bucky table.

The ceiling/wall rail (length 4000 mm) is delivered with a set of ceiling holders for different room heights or a set of wall holders.

5.1.1. Accuracy requirements

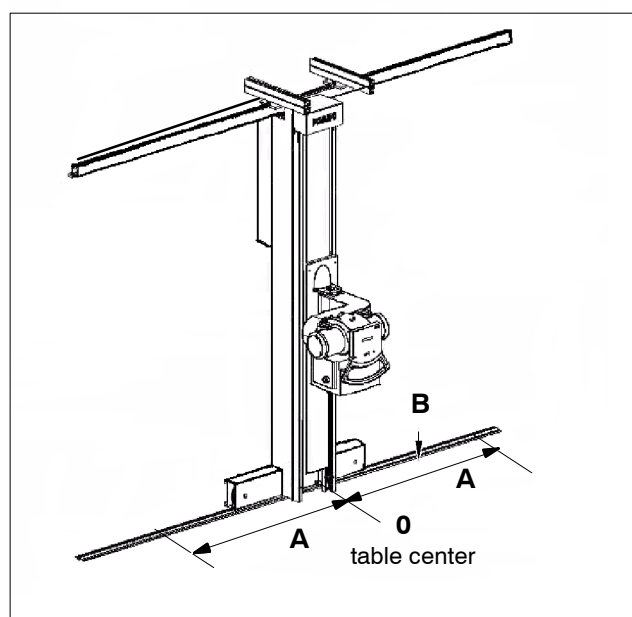
Caution

For a good performance of the system it is important to align the floor rail very precisely!

A	1000 mm
B	≤ 1 mm

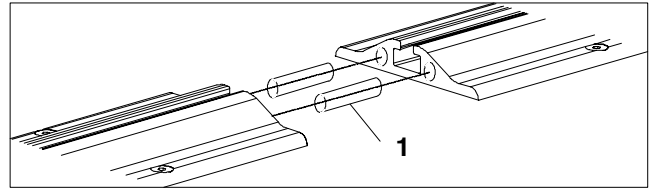
A = distance between table center and right/left side

B = tolerance for the parallelism and evenness of the floor rails



5.1.2. Preparation of the floor rail

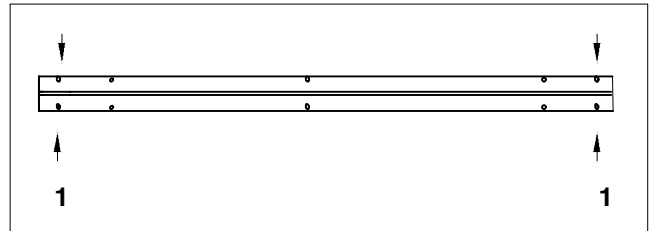
- Insert the pins (1) in the holes in the rails and connect the rails.



5.1.3. Installation of the floor rail

Use adequate fixing material depending on the ground.

- Align the floor rail parallel to the ceiling rail. For the distance between wall/ceiling rail and floor rail refer to the corresponding planning room layout.
- Determine and mark the drilling holes (1).
 - Use the outer rail holes as a drilling template for the rail.
- Drill the outer holes depending on the fixing material.
- Place the dowels and fix the rail.
- Use all other holes in rail as a drilling template.
- First drill max. 5 mm holes in order not to damage the rail.
- Remove the rail.
- Drill the holes to final dimensions depending on the fixing material.
- Place the dowels and fix the rail.



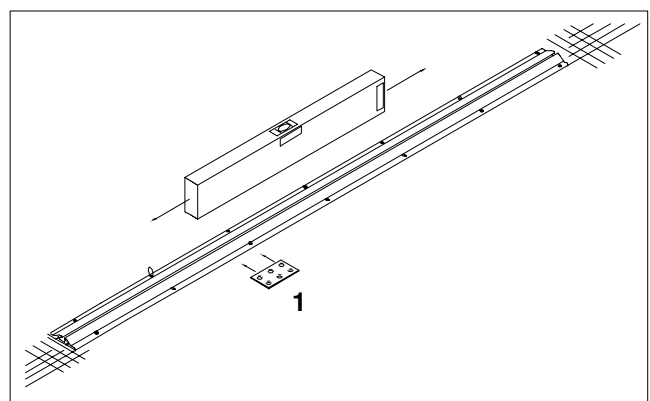
5.1.4. Height alignment of the floor rail

Note

In case of an uneven or instable floor linings have to be used to achieve the required height accuracy.

The linings are delivered in different thickness.

- Loosen the rail and position the balance plate between floor and rail.
- Use the spirit level to check the alignment.



5.1.5. Installation of the guide rail

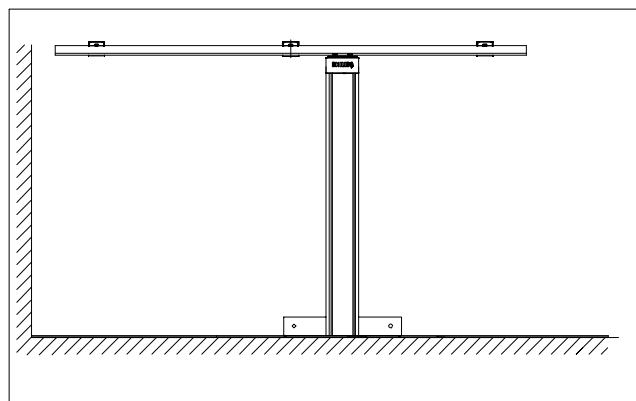
The guide rail (standard length 4000mm) can be installed at the wall with three wall holders or at the ceiling under construction (e.g. Unistrut, Graaf, Wieland or MSR) with three ceiling holders. Before starting refer to the corresponding planning room layout

Fixation with wall holders

Min. ceiling height: 2560 mm

Min. distance between center of floor rail and wall: 242 mm

Max. distance between center of floor rail and wall: 387 mm



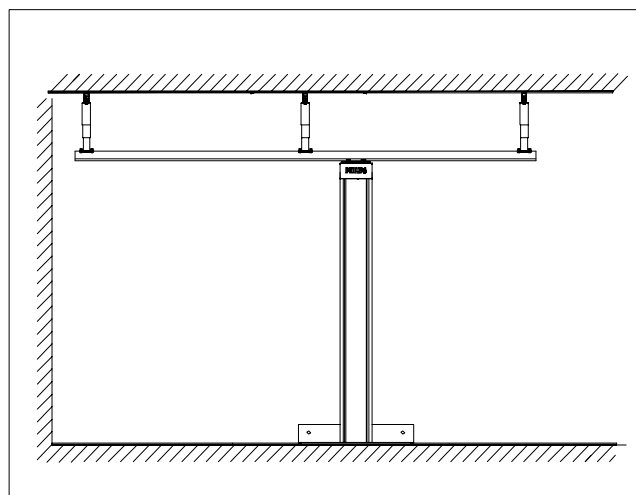
Fixation with ceiling holders

Ceiling height (short version): 2490...2591 mm

Ceiling height (middle version): 2590...2804 mm

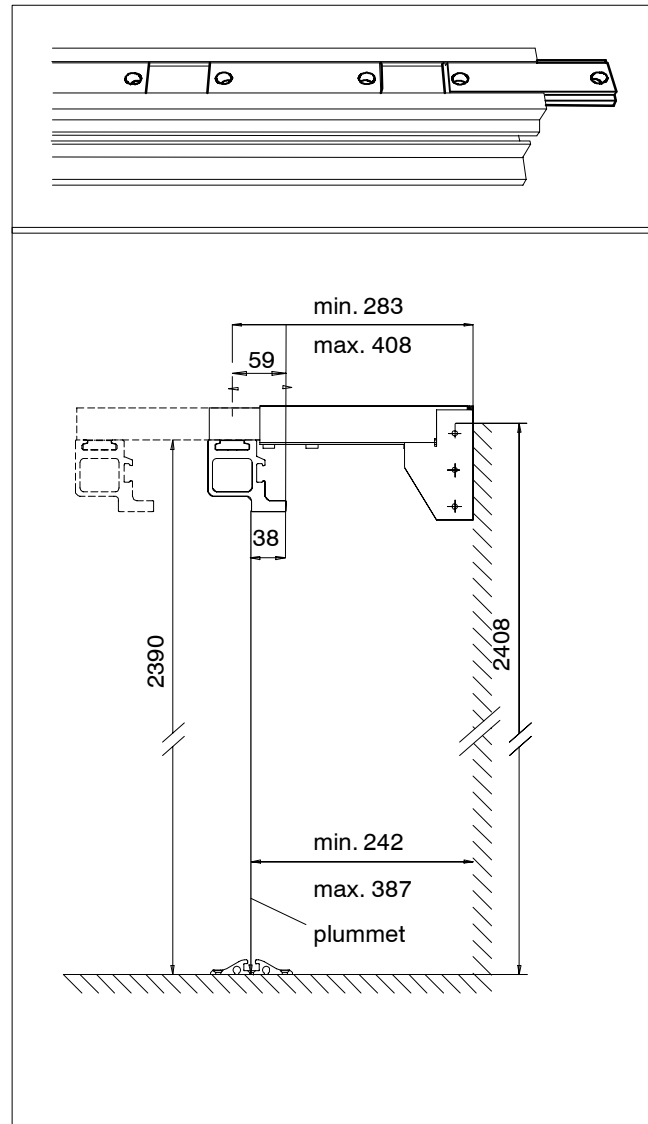
Ceiling height (long version): 2798...3400 mm

Min. distance between center of floor rail and wall: 242 mm



5.1.5.1 Installation with wall holders

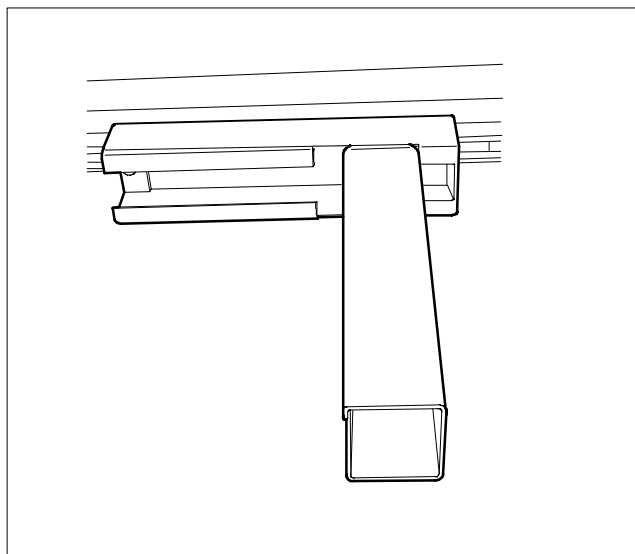
- Mark the holes of the three wall holders at the wall.
For the height and longitudinal position refer to your planning room layout.
- Drill holes according to the chosen dowels/screws from the static calculation.
- Install the three holders.
- Install the remaining parts of the holders.
- Remove the **three** long nuts from the ceiling holders and insert them in the guide rail.
- Install the guide rail at the left and right holder first.
- Adjust the guide rail according to figure.



5.1.5.2. Installation with ceiling holders

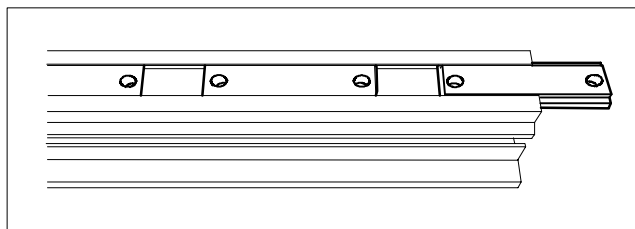
- Install the **three** base holders at the ceiling under construction first (in the figure the long version is shown).

For the transverse position refer to the corresponding planning room layout.

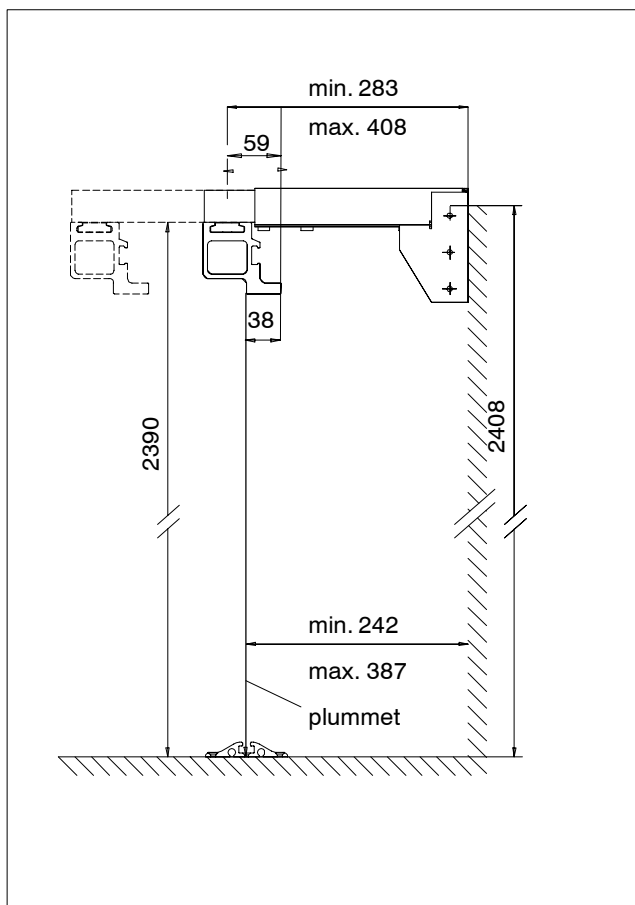


- Install the remaining parts of the holders.

Remove the **three** long nuts from the ceiling holders and move them into the guide rail.



- Adjust the guide rail according to figure.
- Install the guide rail at the left and right holder first

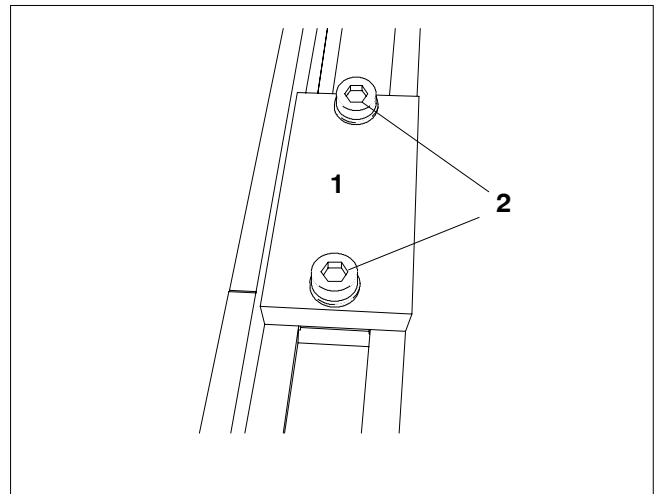


5.1.5.3. Installation of the rail extension (optional)

Note

The extension rail has to be connected to the installed guide rail. The room layout determines the sequence of installation, in small rooms the extension rail has to be installed after insertion of the column into the rails.

- Install the extension rail with an additional wall / ceiling holder.
Refer to chapter 5.1.5.1. resp. 5.1.5.2..
- Connect the guide rail and the rail extension with the connection plate (1).
- Fix the screws (2).



5.2. Insertion of the column into the rail



Caution!

Danger of Injury!

The following procedure should be done by at least two persons!

During the insertion of the column in the rails and the adjustment of the ceiling/wall rail one person has to secure the column against tilting!

For the insertion of the column the wall rail must be 700 mm smaller than the floor rail.

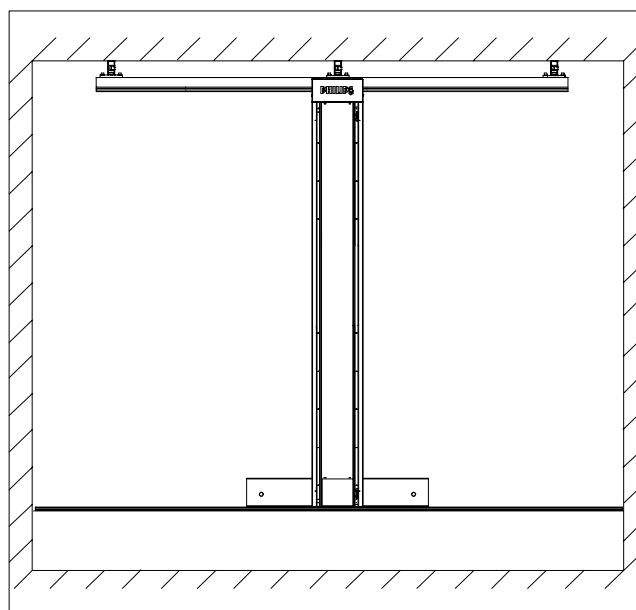
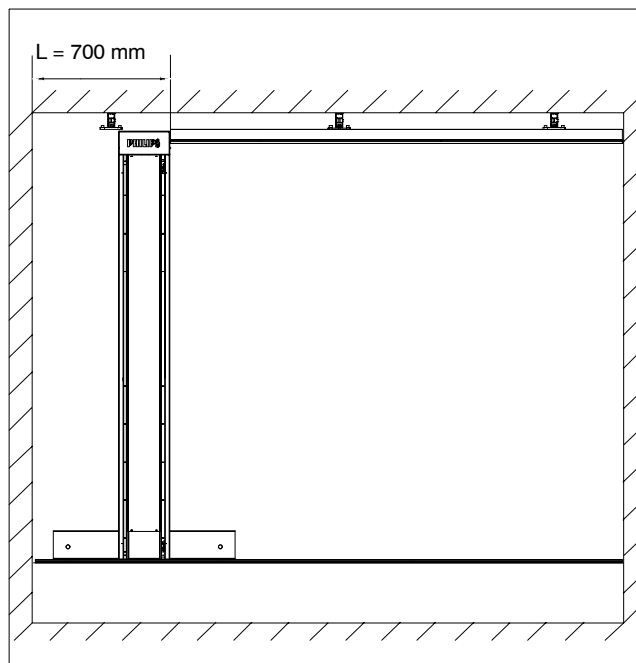
- Move the wall rail opposite to the installation side of the column and fix it (if applicable).
- Clean the floor rail.
- Insert the column carefully into the floor rail by lifting one wheel after the other.
- Move the column carefully into the guide rail.

Caution

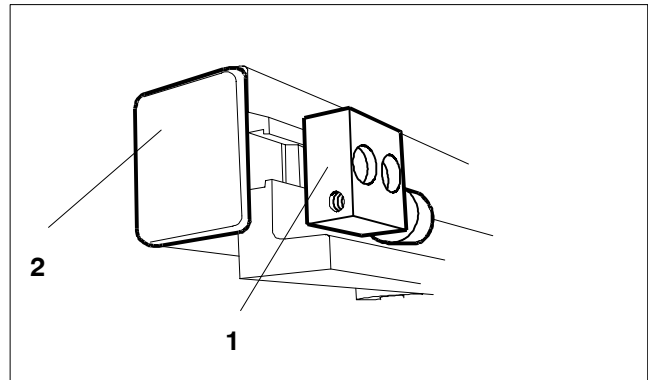
The column has to be inserted in the rails carefully in order not to damage the rollers. Clean the rails before inserting the column!

Pay attention to the catch (micro switches) on the top of the column and on the guide rail!

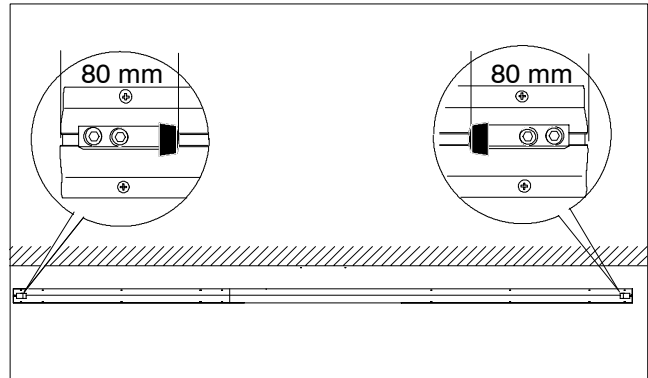
- Move the column into the ceiling/ wall rail.
- Shift the wall rail back to normal position and fix it.



- Install both end stoppers at the guide rail (1).
- Push the covers into the guide rail (2).



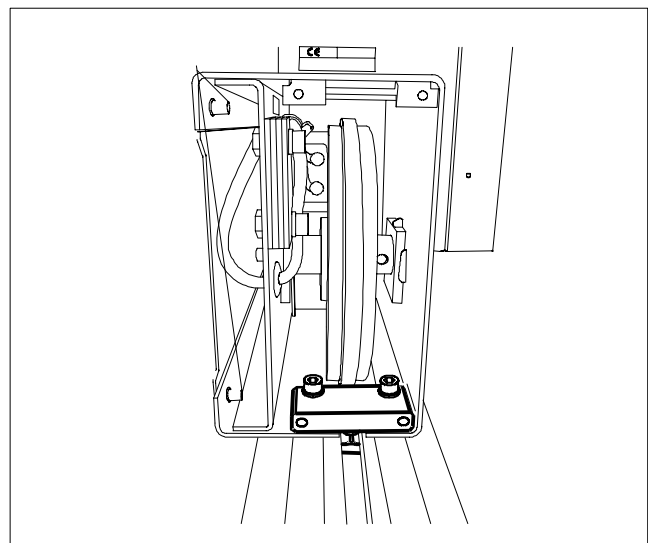
- Install the end stoppers 80 mm from the end of the floor rail.



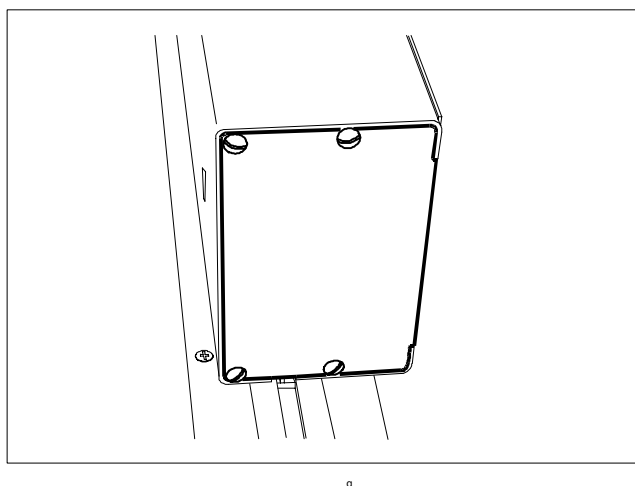
- Insert the rail anchor in the rail and fix it (2x).

Note

When the rail anchors are assembled, the smooth movement of the carriage over the complete range must be tested. In case the movement is not smooth, the rail anchor has to be repositioned.

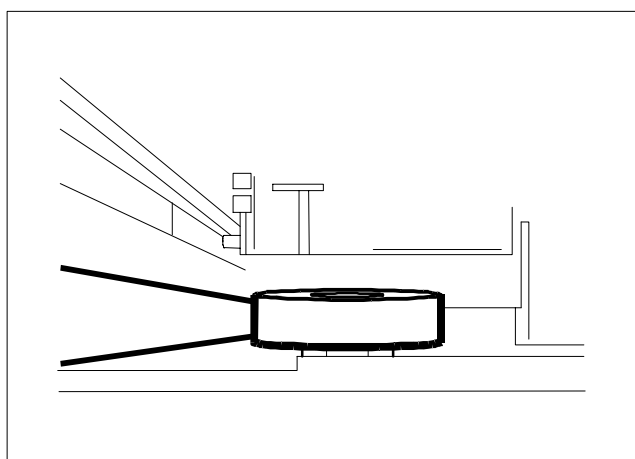


- Install the left and right floor carriage cover each with four flat headed screws.



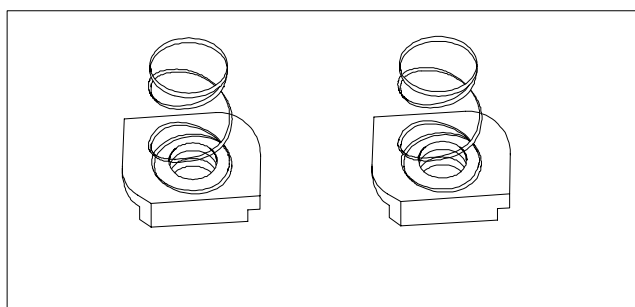
5.2.1 Alignment of the guide rail

- Check the height alignment of the guide rail over the whole moving range of the column.
 - The white plastic bearings have to be centered on the guide rail over the whole moving range.
 - If they are not, re-adjust the height of the ceiling or wall holders.
- Check the vertical alignment of the column over its whole moving range.
 - If the alignment is not correct, re-adjust the horizontal position of the ceiling or wall holders.
- Fasten all screws of the ceiling or wall holders.
- Install the remaining holders.
- Fasten all screws at the holders.

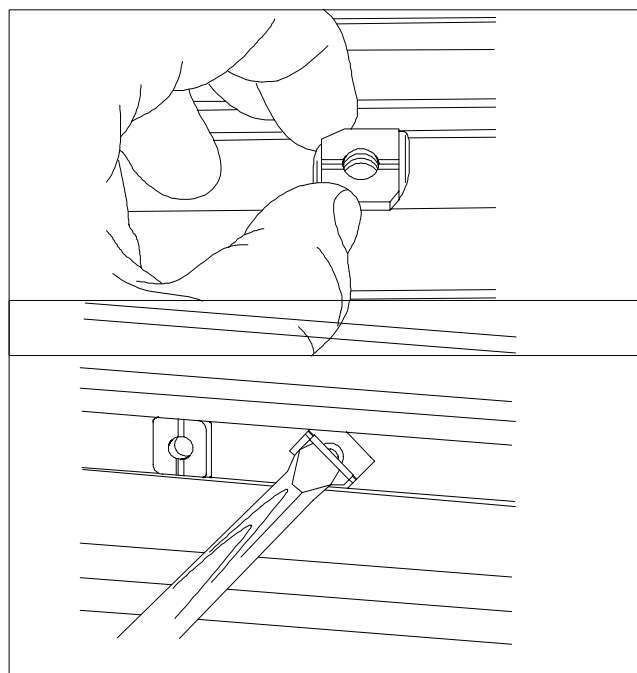


5.3. Installation of the catch plates (FS Compact)

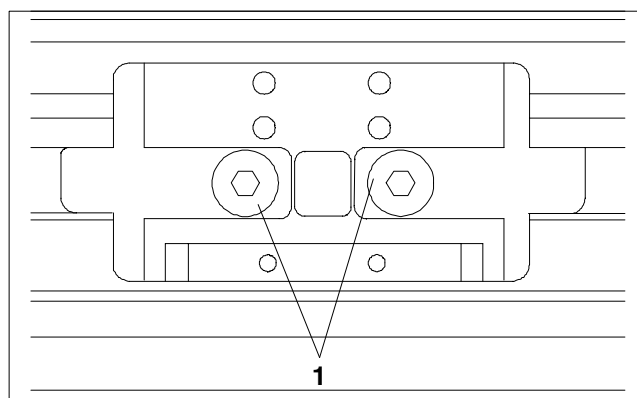
The sliding blocks of the catch plate are modified with a spring at the rear side and a thread at the front side. The new construction makes sure that the catch plate is fixed tightly.



- Install the sliding blocks at the guide rail according to the figures.



- Insert the catch plate into sliding blocks at the guide rail and fix the catch plate with screws (1).



5.4. Final work

- Check the whole moving range of the column.

Note

The bearings have to be properly adjusted over the whole moving range. Use ceiling wall holders for adjusting the height and level of the rail.

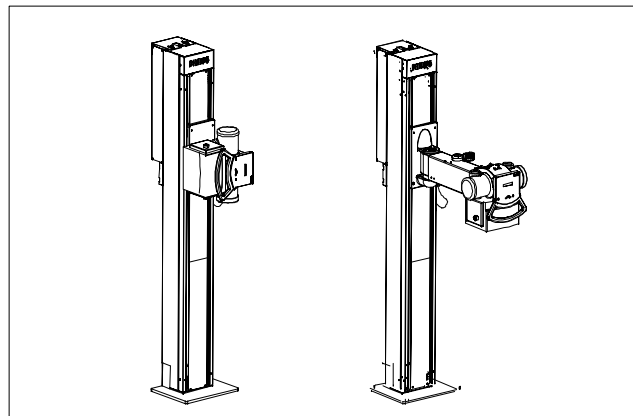
Continue with chapter 7. 'Installation of the tube arm'

6. Installation of FS Fix

 2 h	 2 h	Installation FS Fix - Column installation		
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Note

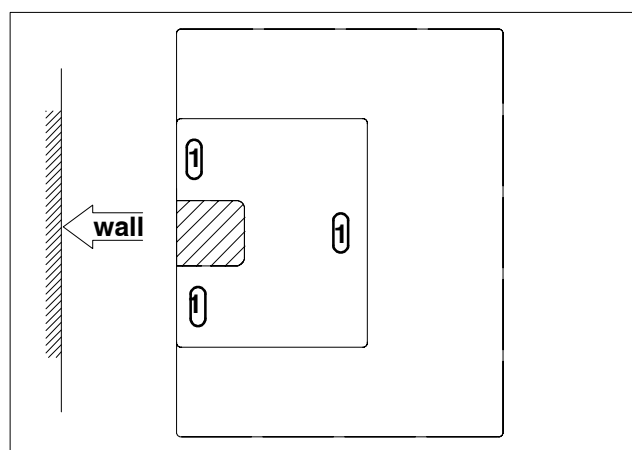
Before starting the installation of the column check the local planning room drawing and PRD!



6.1. Preparation of the installation place

The floor column is fixed at three positions (1).

- Determine the installation place.
- Place the template and align the installation place to the middle of the longitudinal axis of the BuckyDiagnost VE/VT.
- Fix the template.
- Drill three holes 14 mm, 95 mm deep in the middle of the marked area of the three fixing points.



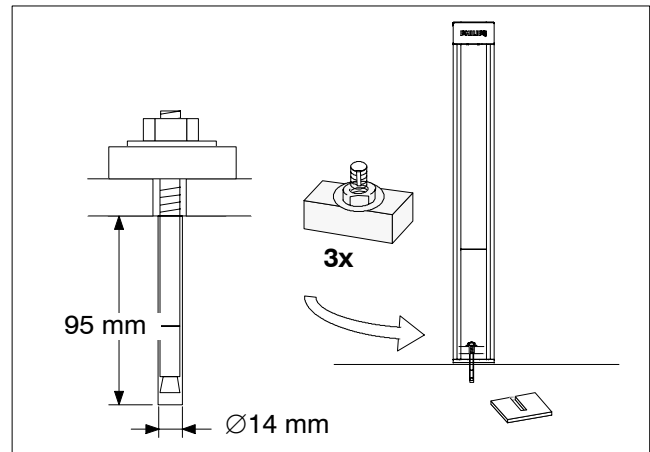
6.2. Column installation



Warning!
Danger of Injury!
Secure the column against tilting after bringing it into upright position and before floor fixation.

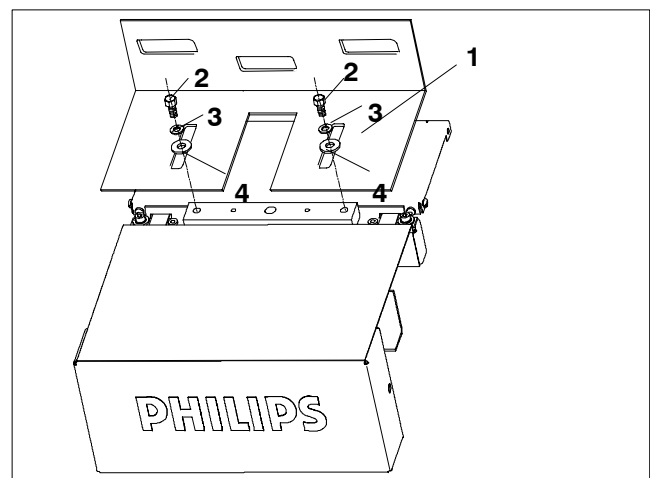
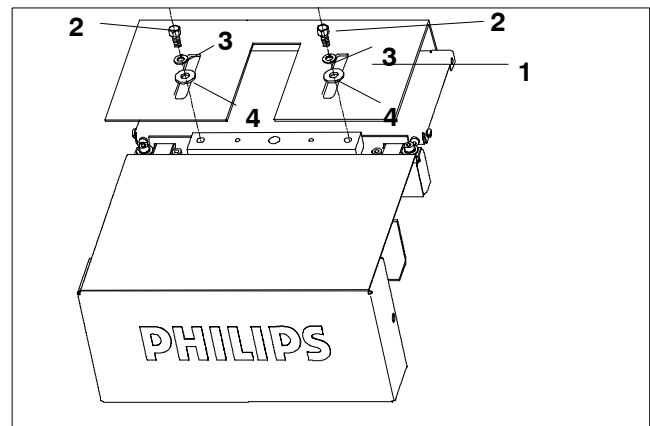
6.2.1. Installation to the floor

- Bring the column into the upright position and move it to its final installation place.
- Fix the column at the floor with the supplied screws and washers (pos. 11,12,13,14 in accessory box).
- Check the verticality of the column with a spirit level.
 - If required, use linings (pos. 26, 27 in the accessory box) for compensation.
- Fasten all bolts.



6.2.2. Installation to the wall (optional)

- Screw on the wall holder (1) to the column with screw (2), spring (3), washer (4) (Pos. 5, 6, 7 in the accessories box). The wall holder can be installed to the column upwards or downwards (see figures).



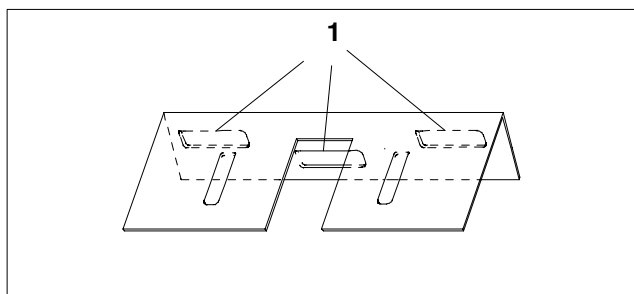
- Mark the positions of the drilling holes (1) on the wall.
- Remove the wall holder.

Note

If the wall holder is installed downwards, the column has to be moved before drilling the holes.

- Drill the holes (8 mm).
- Screw on the wall holder to the column.
- Fix the wall holder to the wall.

Continue with chapter 7. 'Installation of the tube arm'



7. Installation of the tube arm

The following procedure should be done by at least three persons.

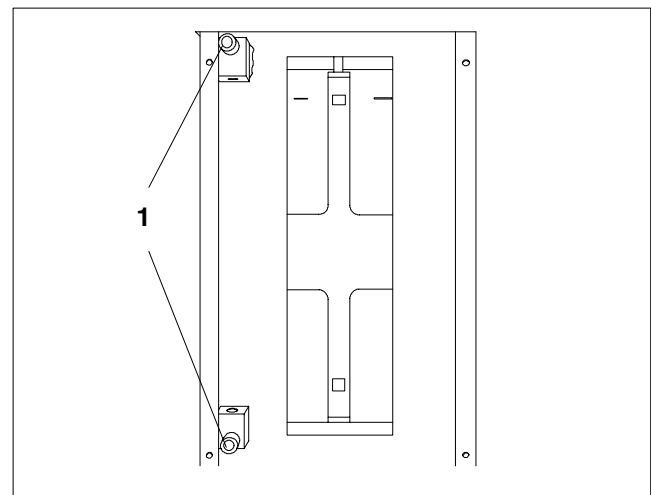
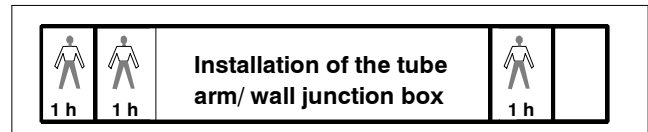


Warning
Danger of Injury!
 Do not put hands or fingers inside until the system movement has been blocked.
 Insert the two “read headed” security screws.

Note

Remove the security screws after the work is finished and place them back into their parking position!

- The counterweight carriage must be left secured with screws (1) until the tube arm and the counterweights are completely installed!



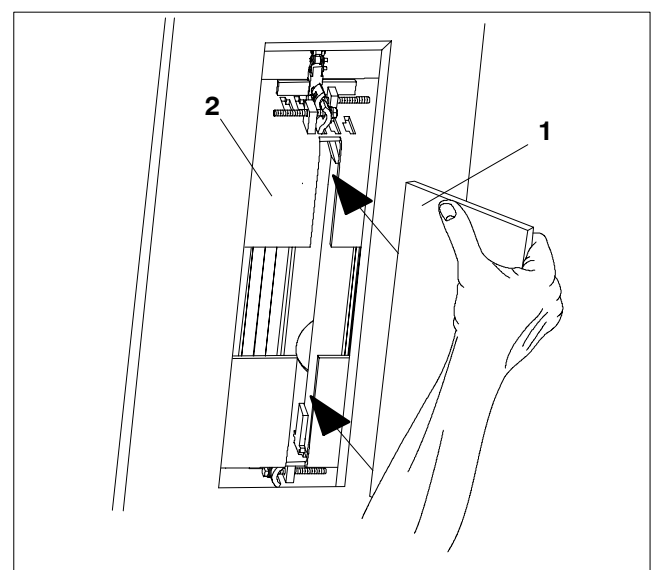
7.1. Insertion of the counterweights

- Insert the counterweights (1) in the weight carriage (2) at the rear of the column.
- Place the weights equally at the left and right side of the weight carriage.

Note

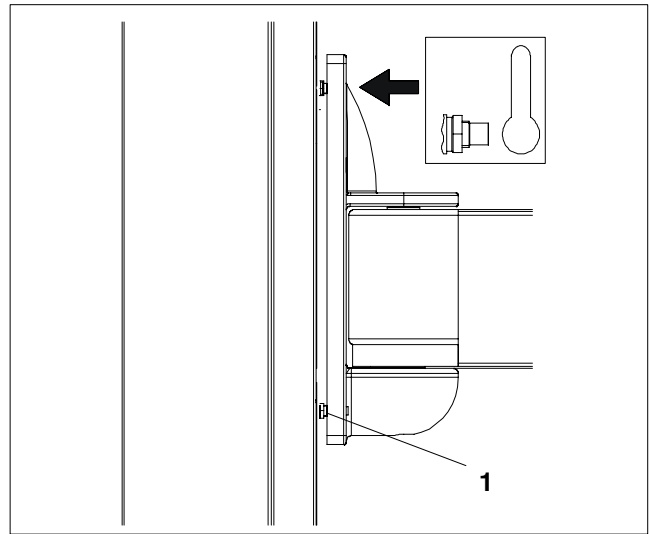
The number of weights depends on the configuration of the system. For FS Standard with all options (tomo, tracking, sensing) 14 weight plates are used. Without options 13 plates are used (11 thick plates and two thin plates).

The balance of the system and the adjustment of the counterweight has to be done during the setting-to-work procedure of the BuckyDiagnost Floor System.

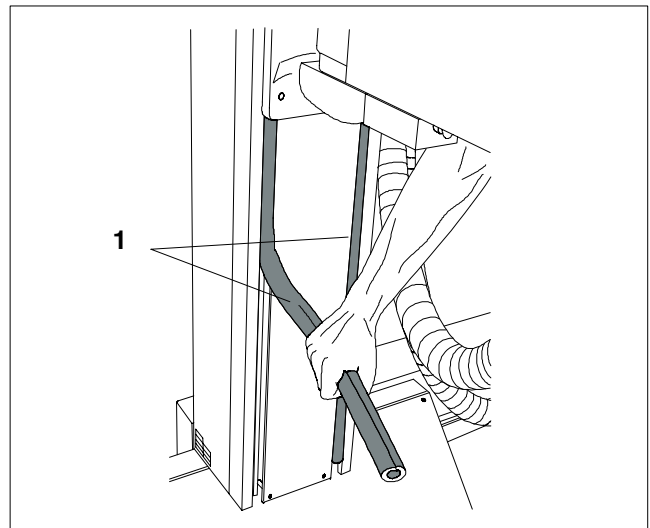


7.2. Fixing the tube arm to the column

- Remove two screws (1) at the lower part of the carriage.
- Attach the tube arm.
- Re-insert the removed screws (1).



- Remove the transport protection (insulating tubes (1)).

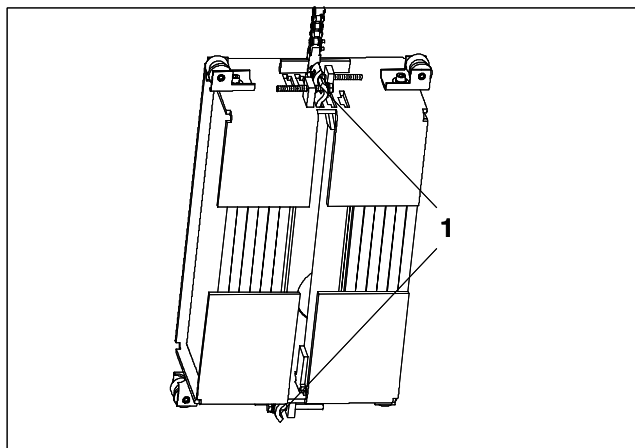


7.3. Weight position fixation

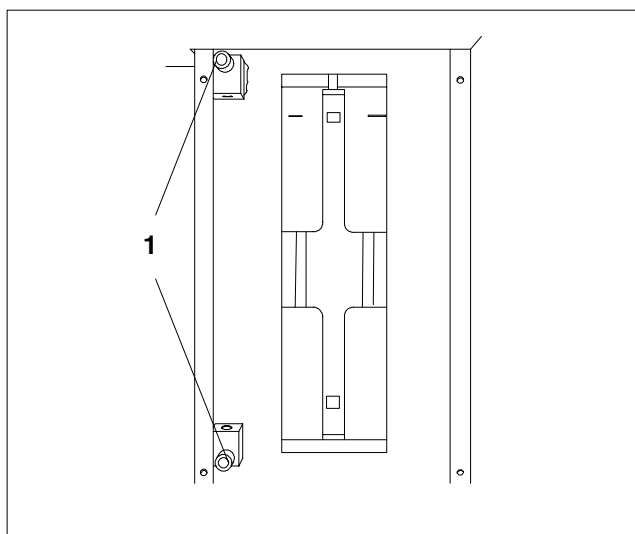
The position of the counterweights in the weight carriage is fixed at the top and at the bottom (1).

Note

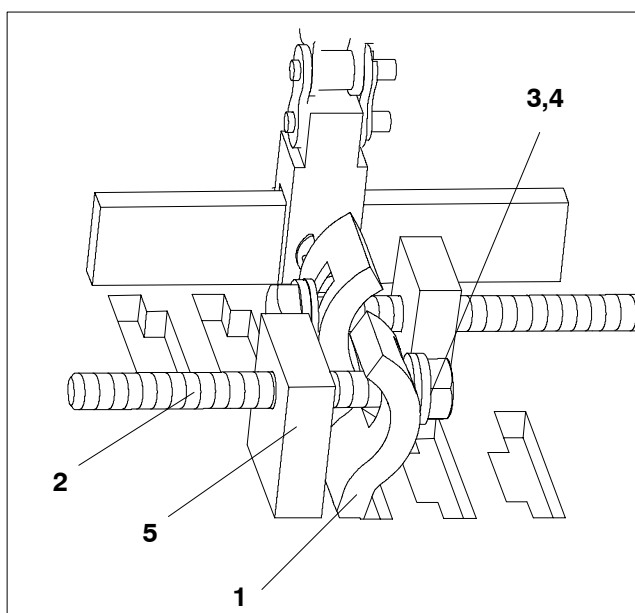
The tube arm has to be moved up and down. Without power connection the brakes for tube arm movement are active, so that extra force is necessary to move the tube arm up and down.



- Remove the transport locking screws (1).
- Move the tube arm up to get access to the weight carriage.



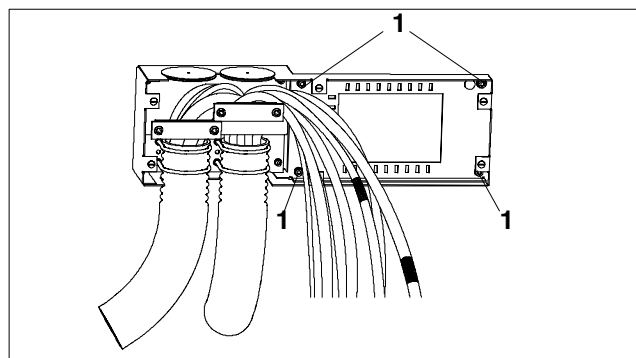
- Use items 23...25 delivered in the accessories box for weight fixation.
- Insert clamp (1) (2x) in one of the three slots.
 - The used slot depends on the number of the installed counterweights.
- Fix the clamp with the screw (2), spring washer (3) and washer (4) at the block (5) (2x). Make sure that the counterweights are secured properly with the clamps.
- Move the tube arm down to get access to the weight carriage bottom.
- Repeat the procedure described above at the bottom of the weight holder.



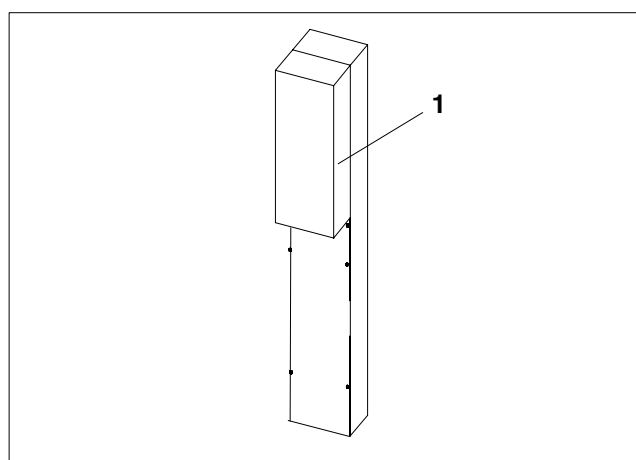
7.4. Cable routing

7.4.1. Standard cable routing

- Remove the cover of the corrugated hose holder.
- Screw on the corrugated hose holder to the rear of the column with four screws (1).
 - The screws are pre-installed at the rear of the column.



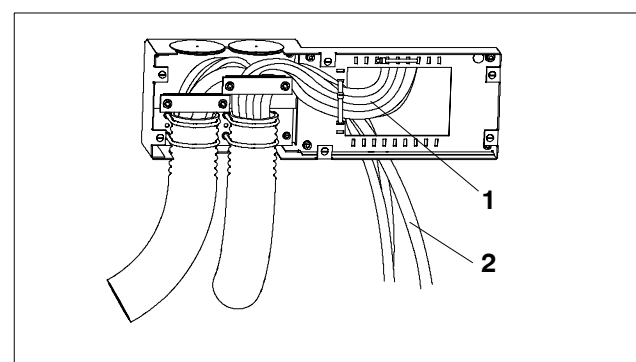
- Remove both lateral covers of the electronic rack (1).



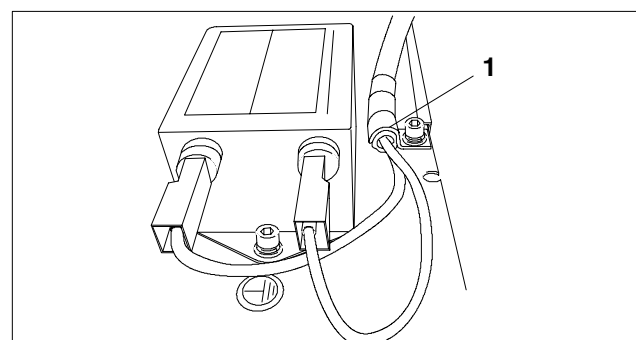
- Route and fasten the cables (1, 2). All cables are labeled with the destination name.

Note

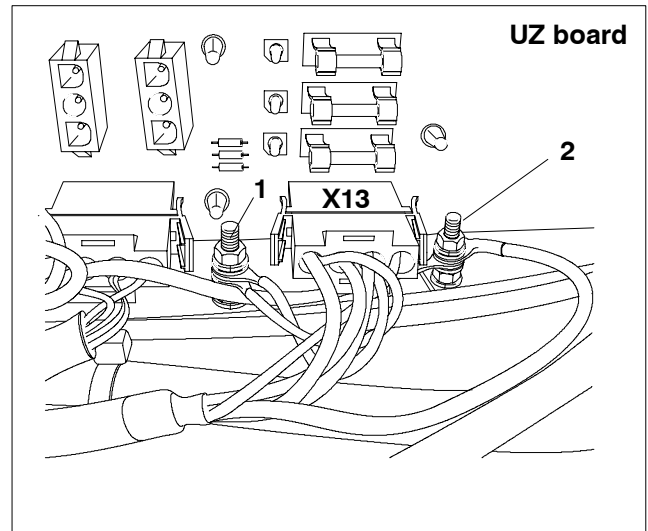
Cables (2) for option tomo within FS Standard systems must be routed down to the column stand.



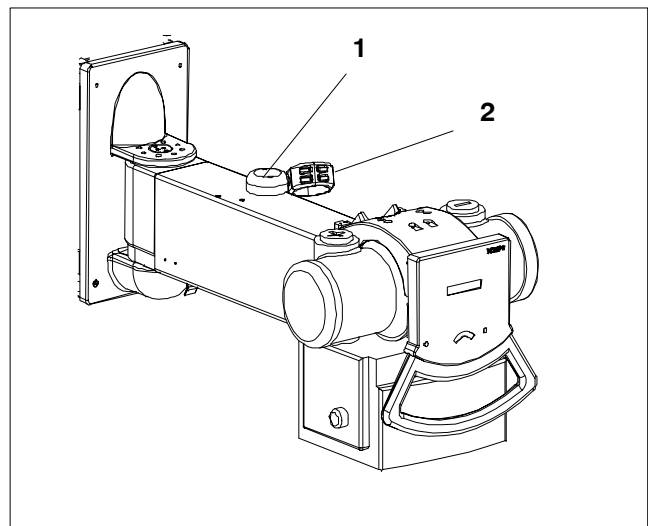
- Use the shielding clamp (1) for the mains power cable UL1.
- Connect the cables to the UZ connecting board.



- Make sure that the two red wires are connected to bolt (1) and the grounding cable is connected to bolt (2).



- Install the corrugated hose holder (1).
- Fix the corrugated hose with the clamp (2).

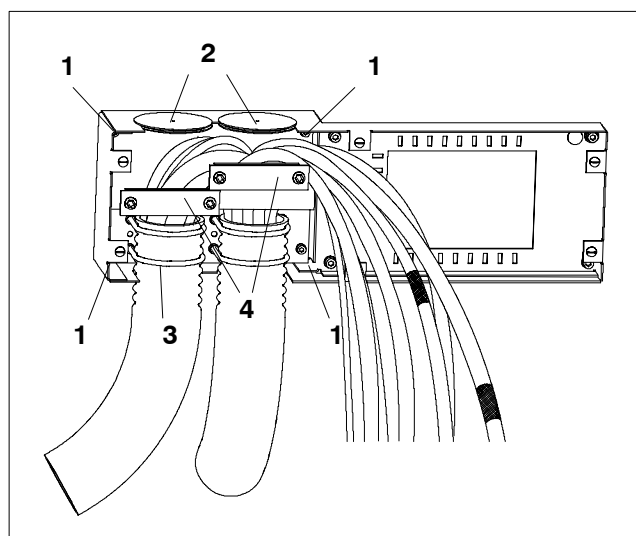


7.4.2. Change of cable routing outlet (left/right)

Note

The delivered version depends on the questionnaire data. Standard installation provides a left-hand side wallstand. For this version the corrugated hose outlet is on the right side of the column (view from front). If changing from right to left outlet is necessary, the following procedure has to be done before the corrugated hose holder is installed to the column.

- Remove the four 3 mm Allen screws (1) from the corrugated hose holder.
- Remove the holder.
- Remove the two round blind caps (2) from the upper side of the metal cable duct.
- Remove the clamps (3) 4 x from both corrugated hoses.
- Remove the cable clamps (4).
- Remove the two corrugated hoses including the cables from the hose holder.
- Interchange the positions of hoses A and B.
- Fix the hoses with the clamps (3) and the cable clamp (4).
- Turn the metal cable duct through 180°.
- Install the corrugated hose holder with the four 3 mm Allen screws (1).
- Install the complete metal cable duct with the corrugated hoses to the column.
- Install the two round blind caps (4) to the upper side of the metal cable duct.

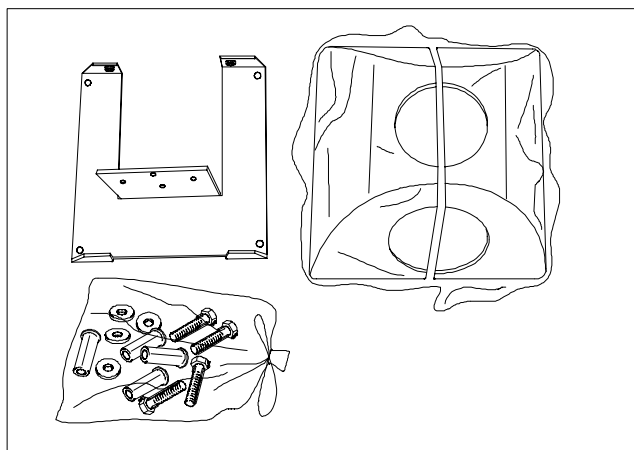


8. Installation of the wall junction box

Note

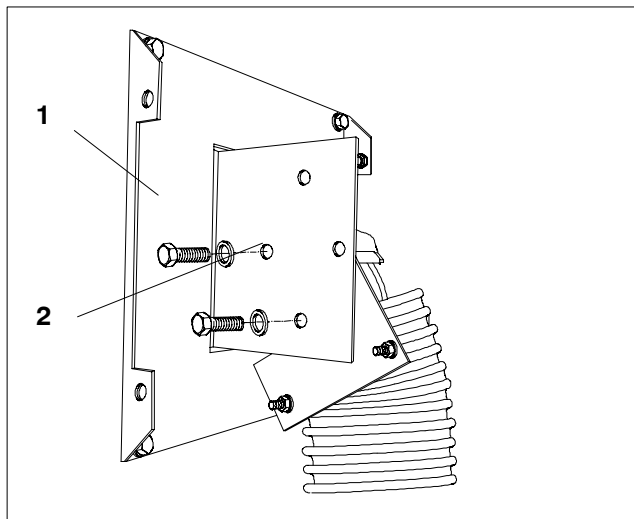
For the installation of the wall junction box refer to local planning room data.

The wall junction box and fixing material is part of the accessory box!

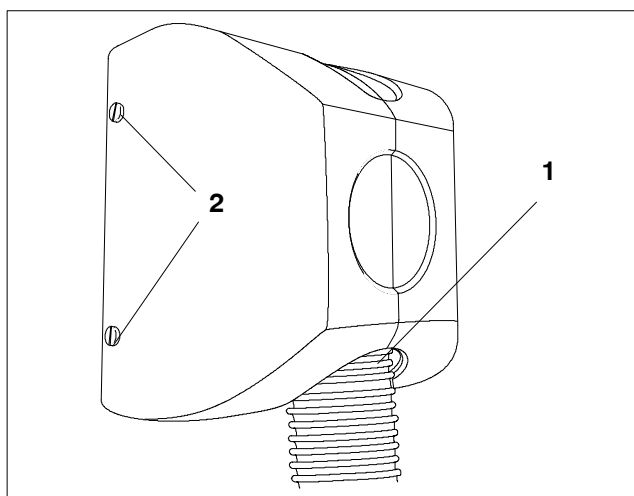


8.1. Wall installation of the wall junction box

- Screw on the base plate (1) at the wall.
- Use four screws and dowels.
- Screw on the fixing plate (2) with the corrugated hose at the base plate.

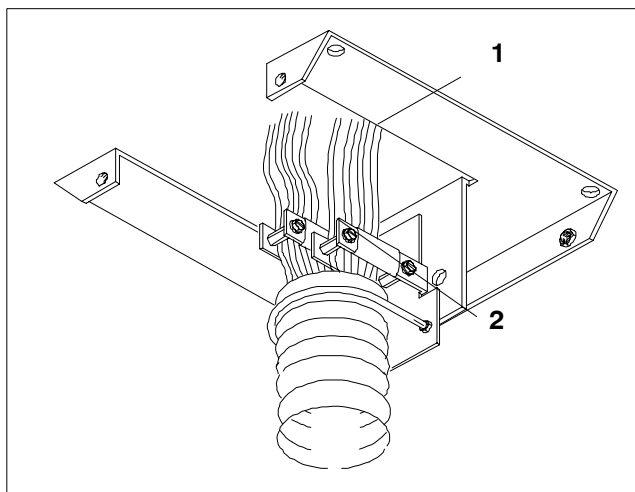


- Cut out the corresponding outlet in the cover (1) and install the cover at the base plate with two screws (2) at both sides.

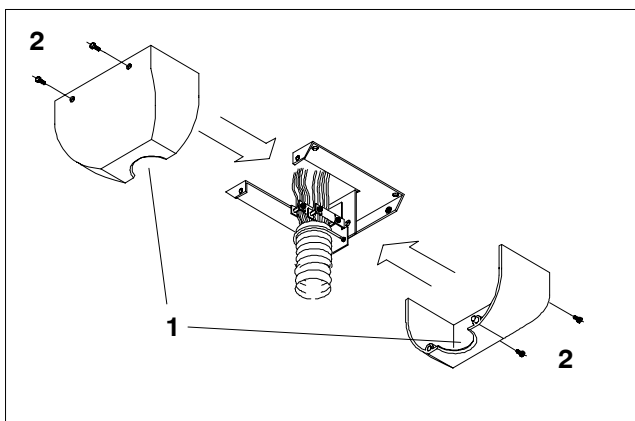


8.2. Ceiling installation of the wall junction box

- Screw on the base plate (1) at the ceiling.
 - Use four screws and dowels.
- Screw on the fixing plate (2) with the corrugated hose at the base plate.



- Cut out the corresponding outlet in the cover (1) and install the cover at the base plate with four screws (2).



9. Electrical connection



Warning

The work on the electronic system only has to be carried out by authorized personnel. Before starting the electrical connection check whether the unit is voltage-free.

The system is supplied with sets of cables including plugs connected at one side.

9.1. Earthing

- Connect the column earth cable (UAX11) to the system power distribution unit. Refer to the earthing diagram in the corresponding SMI manual.

9.2. Power supply cable

- Connect the power supply cable (220V/UL1) to the system power distribution unit. Refer to the connecting diagram in the corresponding SMI manual.

9.3. Signal cable and CAN bus cable

- Connect the signal cable and the CAN bus cable (optional) according to the connecting diagram in the corresponding SMI manual.

10. Installation of the covers

10.1. Installation of the column front covers

- Move the tube arm to its lowest position.
- Insert the front covers (1, 2). The shorter cover is located at the bottom.
- Connect the earth wire X75 to the cover.
- Fix both covers with four screws.

10.2. Installation of the rear bottom cover

- Connect the earth wire X73 to the cover.
- Fix the cover (3) with eight screws.

10.3. Installation of the cable support cover

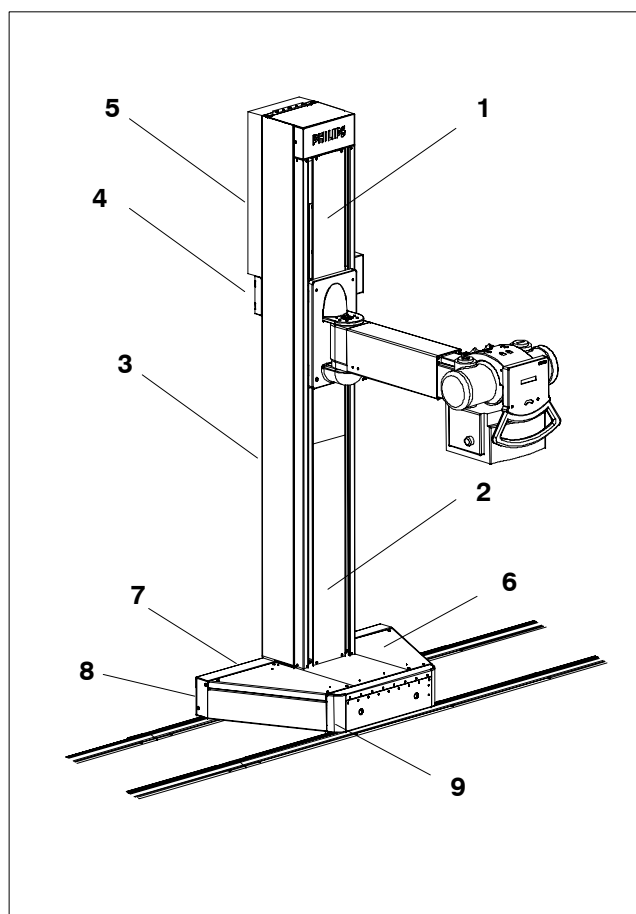
- Connect the earth wire X74 to the cover.
- Fix the cover (4) with six screws.

10.4. Installation of the electronic rack cover

- Connect the earth wires X78,79 to the left and right side covers.
- Fix the cover (5) on both sides of the electronic rack with four screws each.

10.5. Installation of the column base top cover (FS Standard)

- Connect both earth wires X70 to the left and right side covers.
- Fix the cover (6) at both sides of the column base each with four screws.



10.6. Installation of the column base rear cover (FS Standard)

- Connect the earth wire X71, 72.
- Shift the cover to the uppermost position.
- Fix the cover (7) with four screws.

10.7. Installation of column base side cover, rear

- Fix the cover (8) each with four screws.

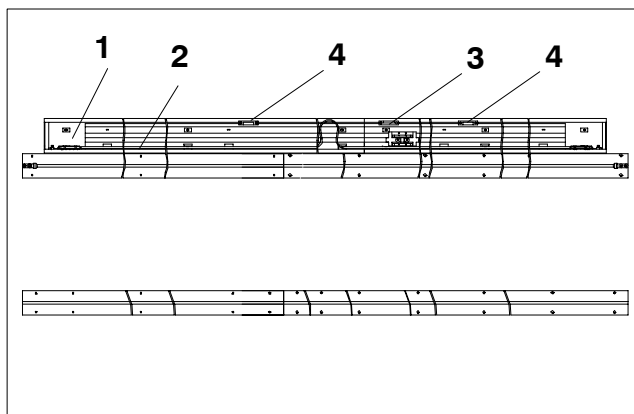
10.8. Installation of column base side cover, front

- Attach the cover (9).

11. Option tomography

11.1. Installation of the tomo rail

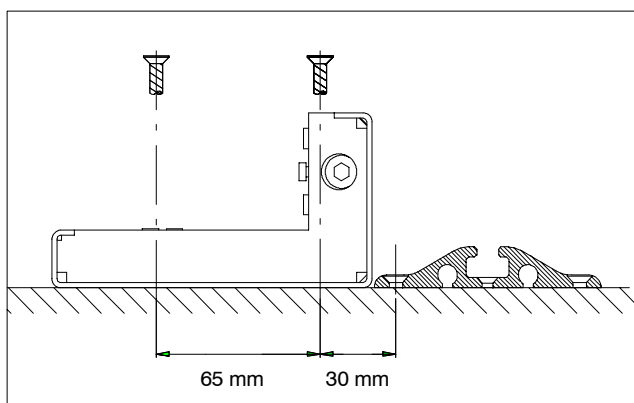
The tomo rail (1) is delivered in two rail parts (three parts with rail extension) and has to be connected and installed to the floor. The toothed belt (2) must be fixed at both sides of the tomo rail. The tomo center switch cam (3) and left and right safety switch cams (4) must be installed and adjusted.



Note

The fixing material has to be obtained locally!

- Park the column in the end position.
- Position the tomo rail on the floor according to the figure.
- Mark the position of the drilling holes.
- Remove the rail and drill the holes.
- Install the rail.



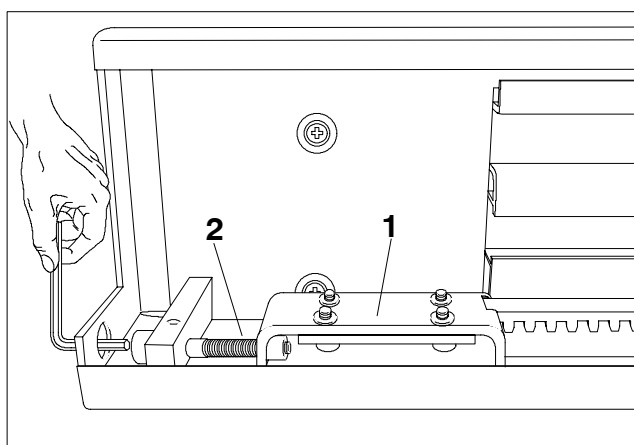
11.2. Installation of the tomo belt

11.2.1. Installing the tightening block at the patient head end side

Note

The tightening block (1) for the tomo belt must be installed at the patient head end side.

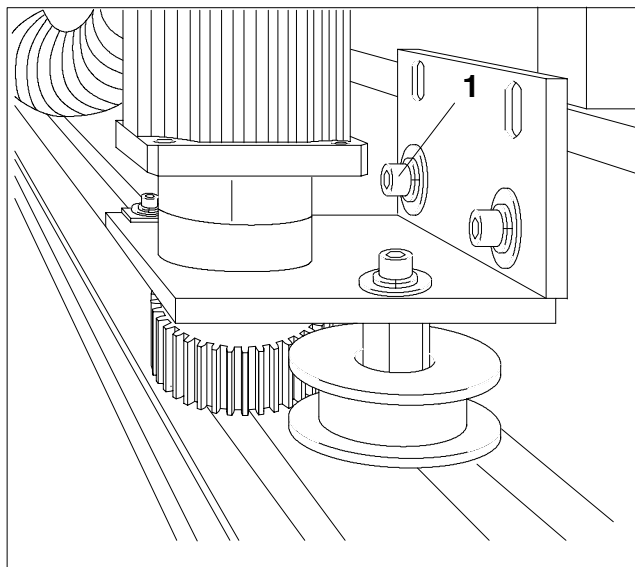
- Loosen the tightening setscrew (2) to allow the adjustment of the tomo belt tension later on.



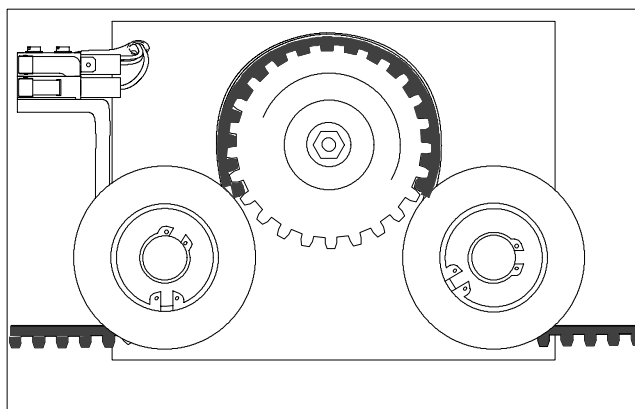
Note

The tomo unit is delivered pre-installed at the column. For insertion of the column in the rails it is installed above its working position.

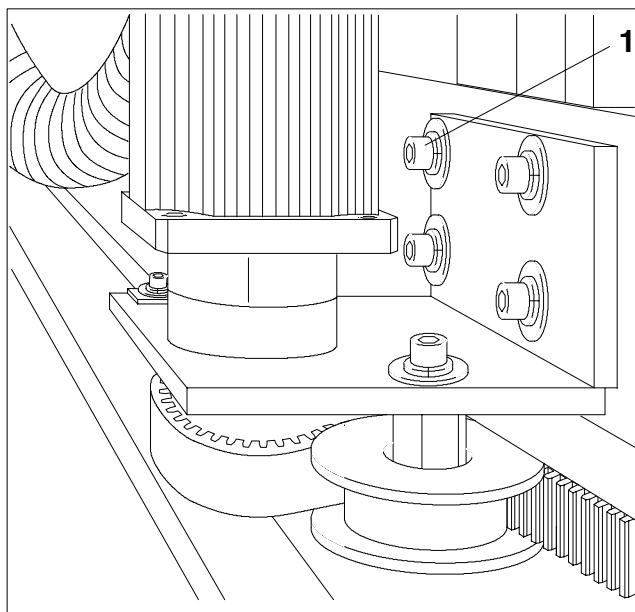
- Remove the two screws (1) and remove the tomo unit.



- Turn the tomo unit and insert the belt as shown.

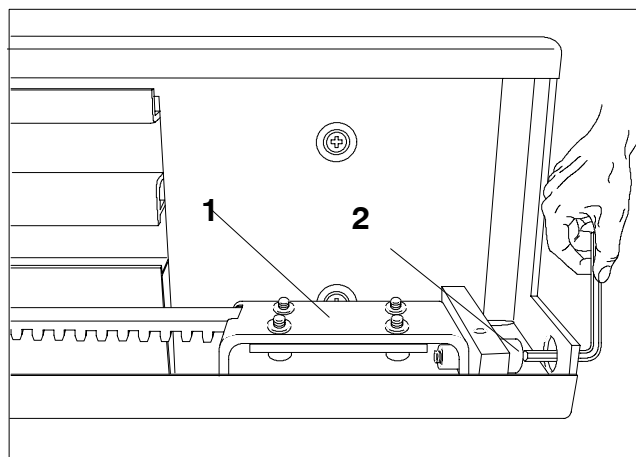


- Fix the tomo unit with the four screws (1).



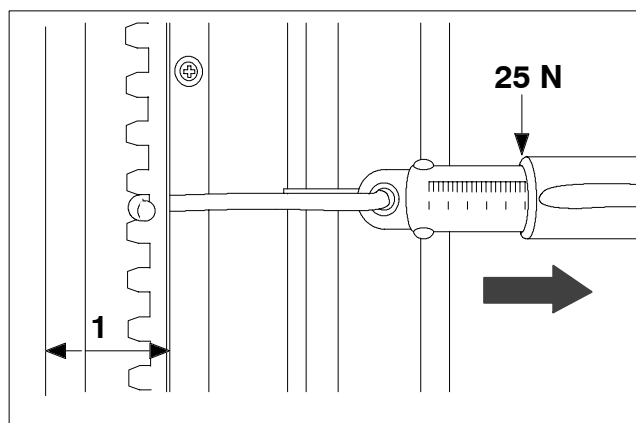
11.2.2. Installation of the tightening block at the patient foot end side

- Fix the tightening block (1) with screw (2).



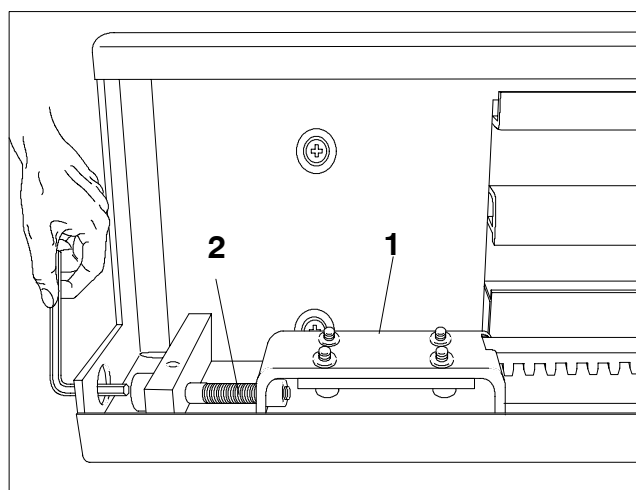
11.3. Adjustment of the tomo belt tension

- Move the column to its end position.
- Check the tension of the belt at the tomo center position with a spring balance.
 - With a force of 25 N exerted, the distance (1) between the edge of the tomo rail and the toothed belt must be about 50 mm.



If necessary loosen or tighten the setscrew (2) at the tightening block (1) to tense the belt.

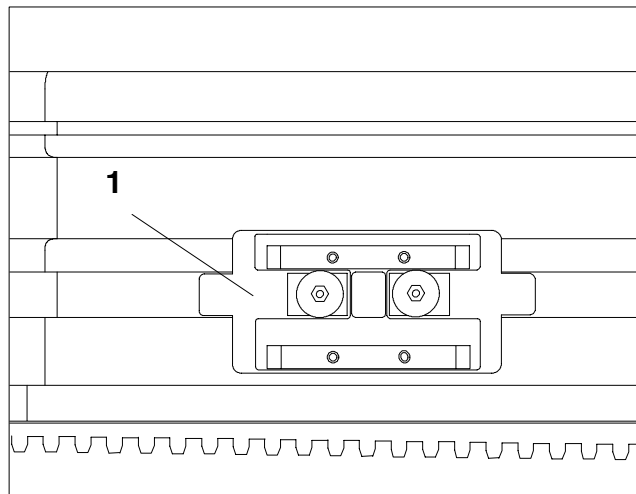
- Repeat the procedure as specified above.



11.4. Installation of the catch plate and tomo center cam

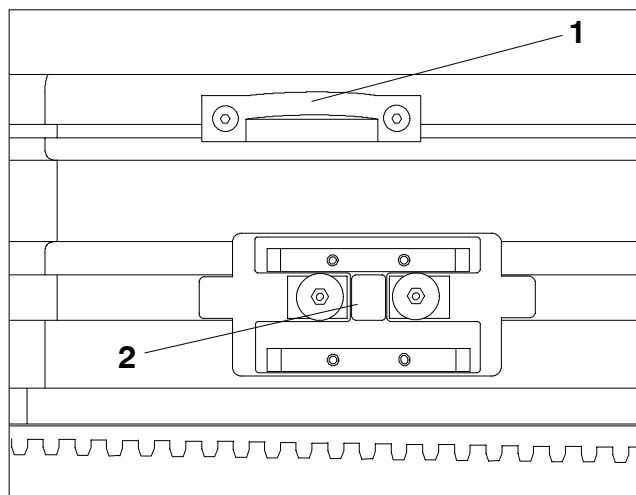
11.4.1. Table center catch plate

- Install the catch plate (1) in such a way that the plate still can be moved along the rails.
- Move the column into the table center position.
- Move the catch plate so the the pin of the catch engages in the catch plate.
- Mark the position of the catch plate.
- Fix the catch plate.

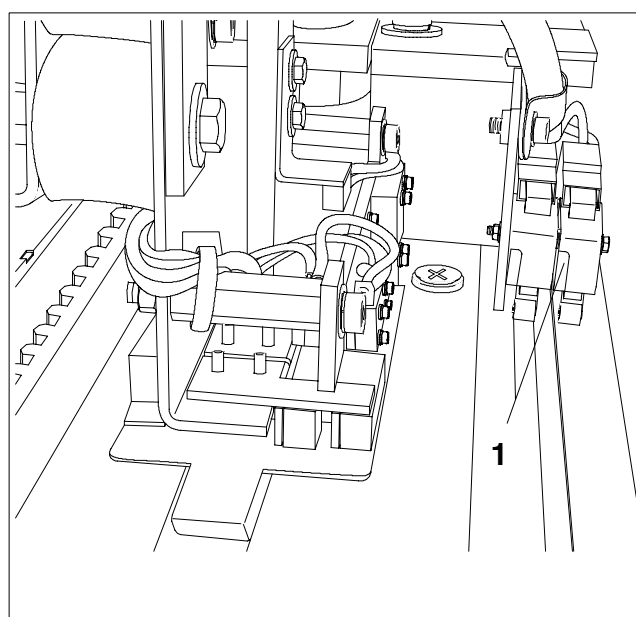


11.4.2. Tomo center position cam

- Install the tomo center cam (1) in such a way that the cam can still be moved along the rails.
- Move the column into the table center position so that the pin of the catch engages in the catch plate (2).

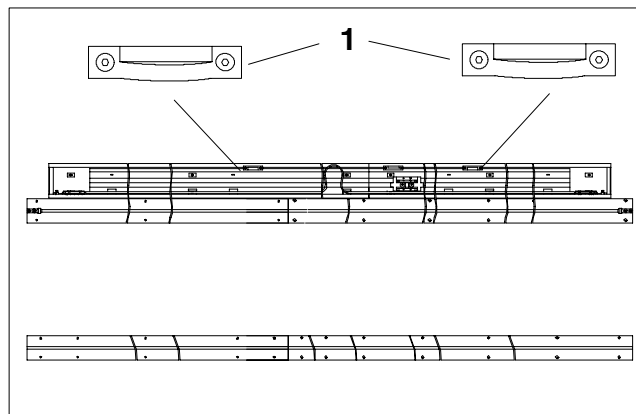


- Move the tomo center cam so that the tomo center switch (1) is activated by the cam.
- Mark the tomo center cam position.
- Fix the tomo center cam.

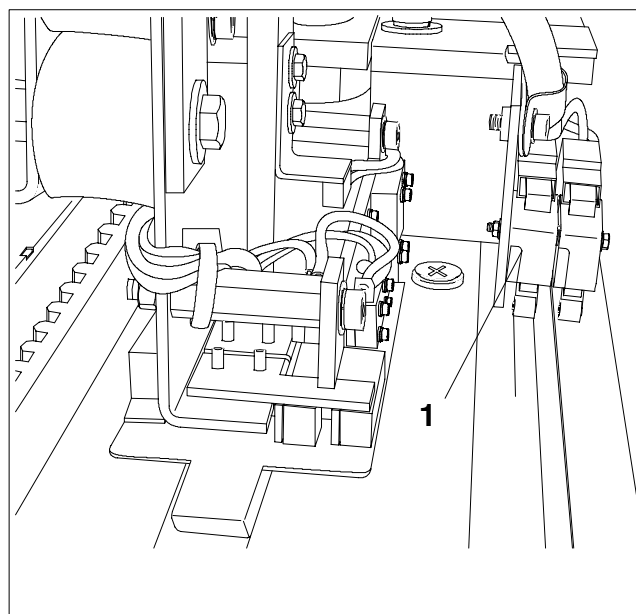


11.4.3. Tomo safety switch cams

- Install the safety end position cams (**1**) 650 mm left and right from the tomo center position.



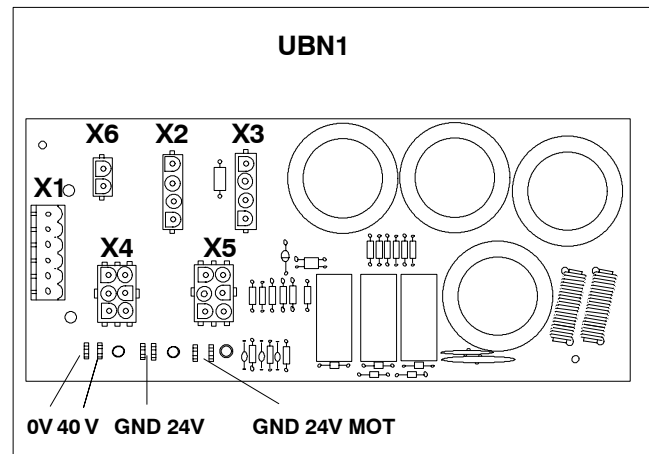
- Move the column into the left and right position and check the function of the tomo safety switch (**1**).



11.5. Electrical connection tomography

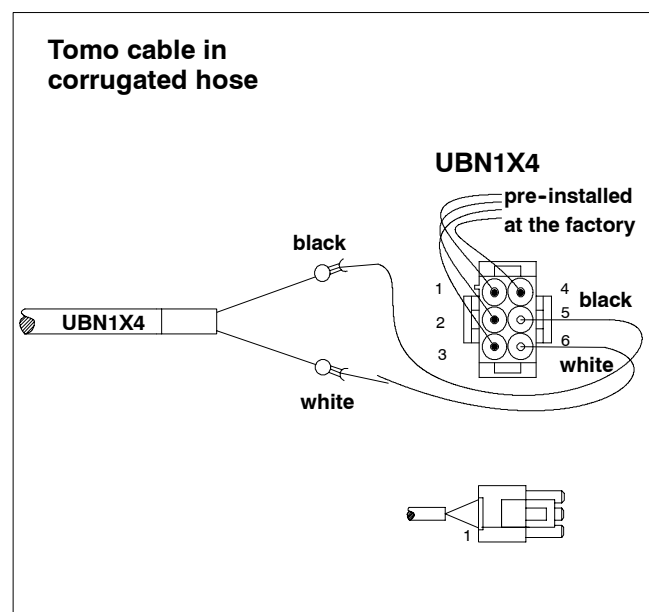
The figure shows board **UBN1**, located at the right side of the column carriage.

For the electrical connection of tomo **X4** must be used.



The tomo cable **UBN1X4** coming out of the corrugated hose is split into a black and white wire.

- Connect the black wire to pin 5 on board **UBN1X4**.
- Connect the white wire to pin 6 on board **UBN1X4**.



12. Option tracking

The option tracking is completely installed at the factory.

13. Setting-to-work

Refer to the corresponding SMI manual.

14. Performance check

N/A

15. Hand-over preparation

Completely clean from dirt and grease residues with alcohol.

1. Fault finding

Use manual SMCM BuckyDiagnost TH2, manual
Code No. 4512-984-2218x.

Replacement

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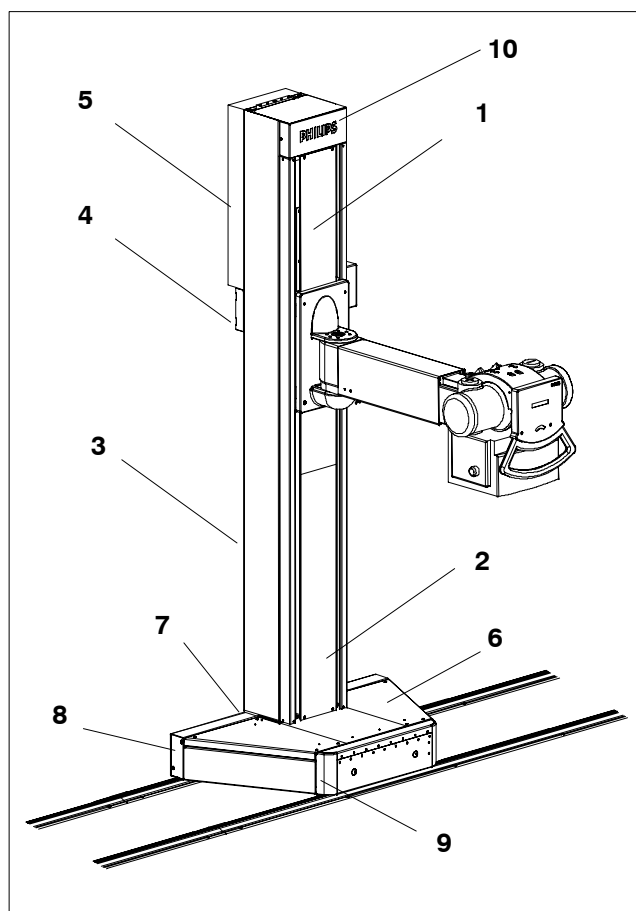
2.4.3.	Replacement of the catch Code no. 4512-133-0452.	4-55
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1. FS Standard

1.1. Overview over the covers

When performing the replacement procedures, the following covers may be affected:


- 1 = Column front cover top
- 2 = Column front cover bottom
- 3 = Rear bottom cover
- 4 = Cable support cover
- 5 = Electronic rack cover
- 6 = Column base top cover
- 7 = Column base rear cover
- 8 = Column base side cover, rear
- 9 = Column base side cover, front
- 10 = Column top cover



1.2. Carriage

1.2.1. Replacement of the longitudinal brake

Code No. 4512 131 2172.

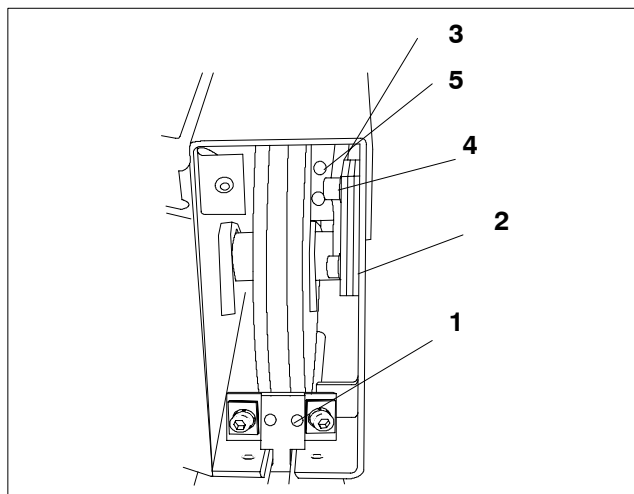
 1 h	Replacement of the longitudinal brake	
---	---------------------------------------	--

- Switch the system OFF.
- Remove the column base rear cover and the column base side cover, rear (7, 8) of the carriage.
- Remove the rail anchor (1) with an Allen key.


Note

Remember the order of the distance plates.

- Remove the distance plates (2).
- Loosen the clamp (3).
- Disconnect the cable (4).
- Remove the brake (5).
- Install the new brake.
- Connect the cable (4).
- Fix the clamp (3).
- Adjust the brake.
- Install the rail anchor (1).
- Ensure that the wheel runs free.
 - If not, change the position of the distance plates.
- Re-install the cover.



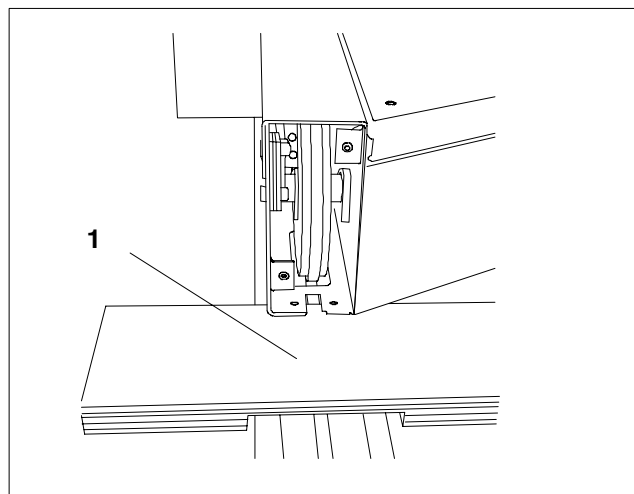
1.2.2. Replacement of the rear wheel**Code No. 4512 133 0418.**

 1.5 h	Replacement of the rear wheel	
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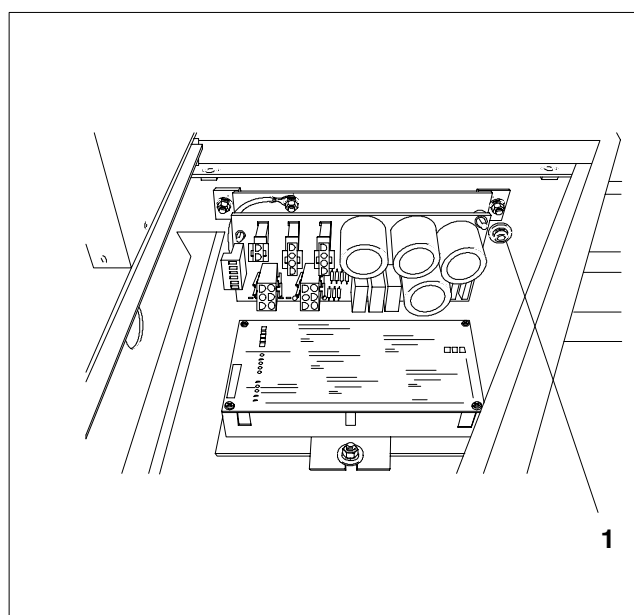
Note

If one rear wheel is defective, check and ensure the good condition of the other one.

- Remove the brake. Refer to chapter 1.1.1 “Replacement of the horizontal brake”.
- Lift the floor carriage some millimeters so that the rear wheel runs free.
- Fix the position, for instance, with a wooden bar (1).



- Remove the screw M6 (1) with an Allen key.



Note

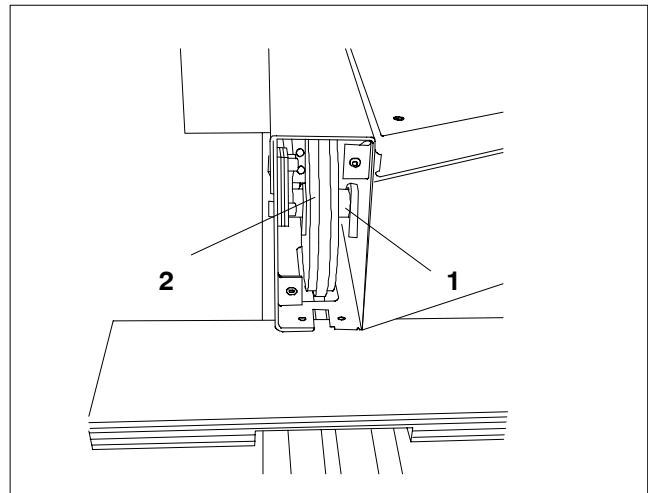
Keep in mind the order of the distance rings on the mandrel.

- Remove the mandrel (1).
- Remove the wheel (2).
- Place the distance rings in correct order and the new wheel on the mandrel.
- Insert the mandrel and fix it.


Note

Ensure that the order of the distance plates of the brakes is correct.

- Install the brake according to chapter 1.1.1
“Replacement of the horizontal brake”.
- Install the anchor rail.
- Re-install the covers.
- Check the functions.



1.2.3. Replacement of the front wheel**Code No. 4512 133 0431.**

 1 h	Replacement of the front wheel	
---	--------------------------------	--

Note

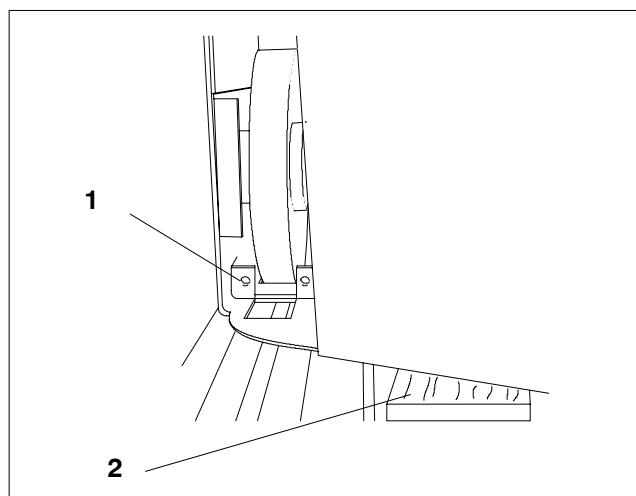
If one front wheel is defective, check and ensure the good condition of the other one.

- Switch the system OFF.
- Remove the top and the front side cover (6, 9).
- Remove the rail anchor (1).

Note

Keep in mind the position mark on the bolt.

- Lift the front and position the carriage on a wooden bar (2).

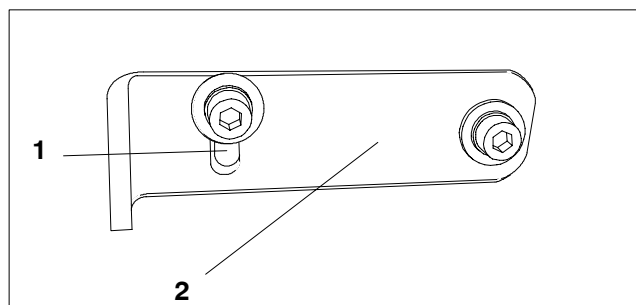
**Note**

Keep in mind the position of the leveling plate (1).

- Remove the leveling plate (2).

Note

Keep in mind the order of washers and distance rings.




- Replace the front wheel.
- Level the wheel.
- Remove the wooden bar.
- Fix the rail anchor.
- Re-install the covers.
- Check the movement of the column.

1.3. Column

1.3.1. Replacement of the chain

Code No. 4512 133 0340.

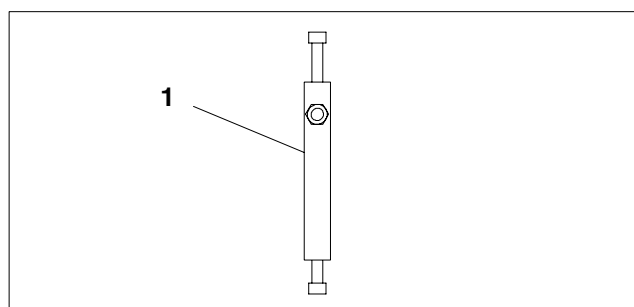
 4 h	Replacement of the chain	
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Note

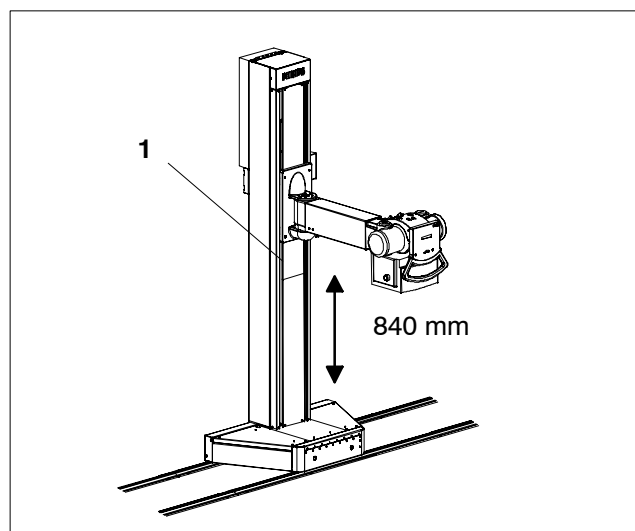
The system has to be switched on to have an activated vertical brake.

Two persons are necessary to change the chain.

- Unscrew both column front covers (**1, 2**) (see overview on page 4-1).
- Move the bucky module to its lowest position.
- Remove the front cover top (**1**).
- Move the bucky module to its highest position.
- Disconnect the ground wires at the covers.
- Remove the rear bottom cover (**3**).
- Remove the top cover (**10**).
- Move the vertical carriage up to get access to the counterweight carriage at the rear of the column.
- Remove the fixation of the counterweight plates.
- Remove the red distance piece (**1**) installed at the rear side of the column.

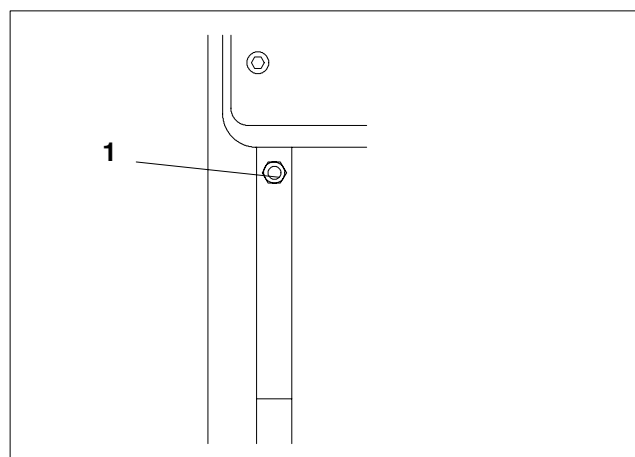


- Take out one hexagon screw (1) at the front slide rail and install the red distance piece.
 - Use the position at 840 mm (measured from the top of the floor carriage).

**Note**

Use the distance piece upside down (short distance from the hole to the edge towards topside).

Do not use a screw at position (1). The vertical carriage directly bears on the distance piece.



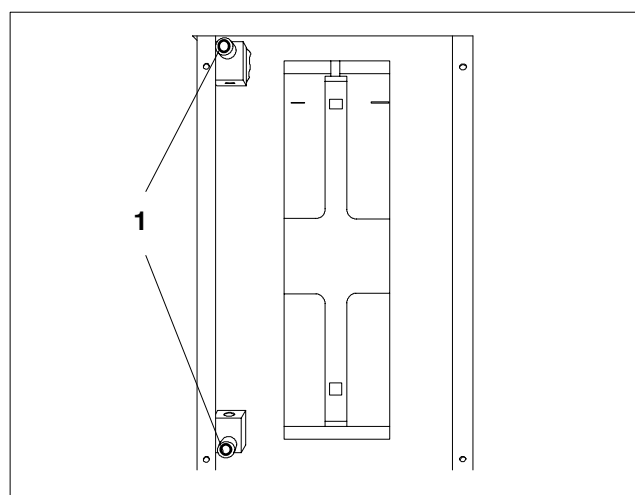
- Remove all counterweight plates.

Note

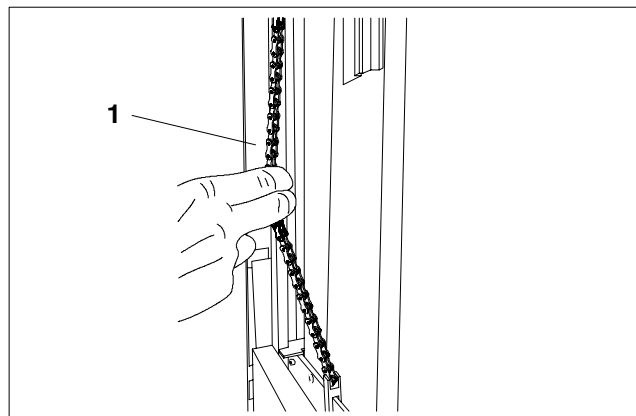
Secure the counterweight carriage with red headed screws (1).

In order to insert the lower screw lift up the carriage with a screw driver.

The counterweight carriage should then bear on the lower screw.



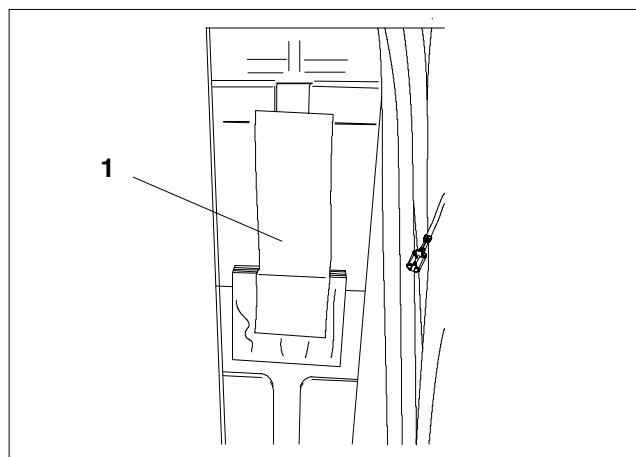
- Release the vertical brake.
- Pull the chain to the front (1).
- Remove the chain fixation.



- Insert the slot of the wooden tool in the weight carriage.
- Fix the wooden tool with tape (1) at the counterweight carriage.

Note

The deeper slot points at the top.

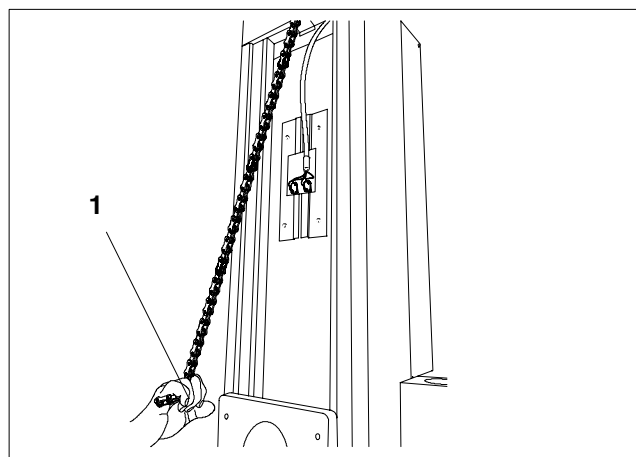


First engineer:

- Hold the chain with a screw driver (1).
- Release the vertical brake.
- Let the counterweight carriage slowly down.

Caution!

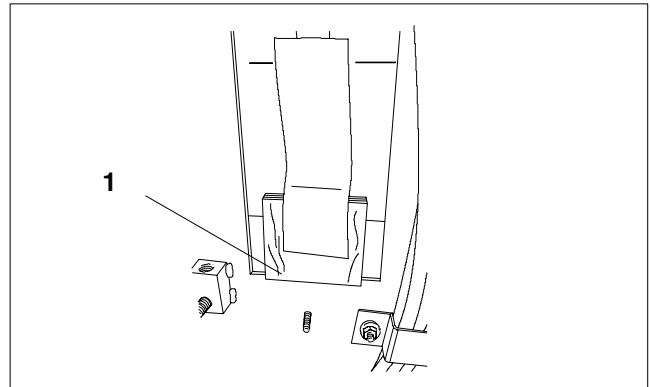
Let down the chain vertically, otherwise the chain comes off the chain wheel.



Second engineer:

- Check correct positioning of the wooden tool (1).

The wooden tool is securing the weight carriage in the lower position.



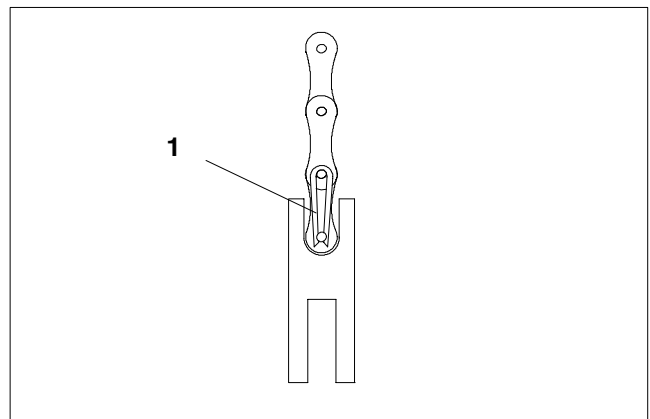
- Remove the retaining ring of the axle on counterweight carriage side.
- Take out the axle.
- Remove the old chain.

Note

Before installing the new chain, check if the chain lock (1) is installed properly in its locking position.

To install the new chain proceed as follows:

- Insert the threaded bolt between the chain clamp and the chain holder at the counterweight carriage.
- Fix the connection with the self-locking nut.

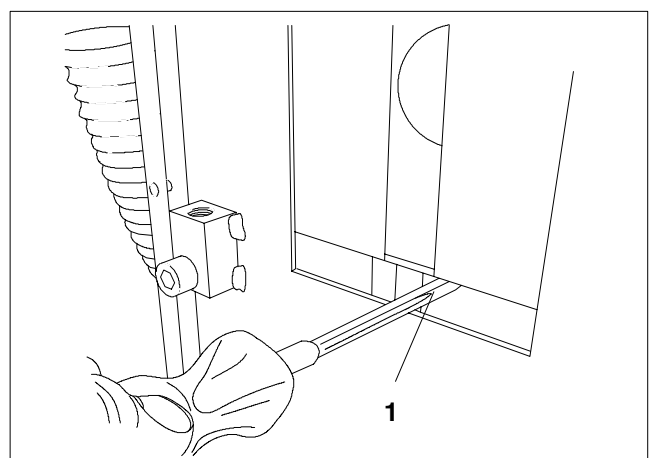


Note

Fasten the nut until it reaches the end of the thread. Do not fasten the screw too much, otherwise the chain clamp can be twisted!

Check the correct positioning of the screw with a mirror.

- Release the vertical brake.
- Lift up the counterweight carriage with a screw driver (one engineer) (1).
- Screw in the lower red headed screw (second engineer).
- Remove the wooden tool.



Note

Before installing the chain fixation, check if the chain lock (1) is installed properly in its locking position.

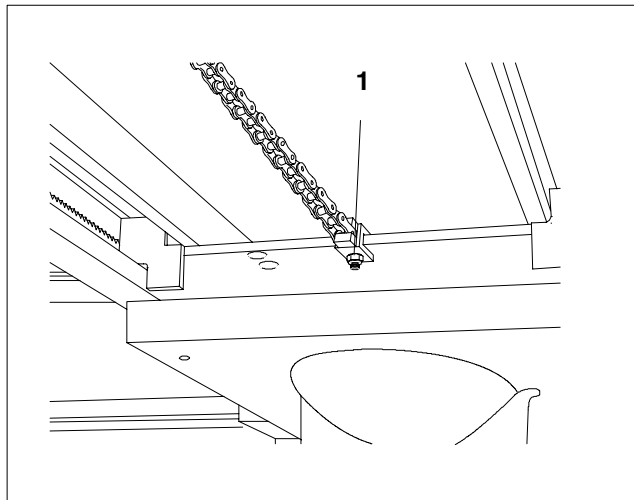
- Install the chain fixation (1) on bucky / tube carriage side.

Note

Fasten the nut until it reaches the end of the thread. Do not fasten screw too much, otherwise the chain clamp can be twisted!

Check the correct positioning of the screw with a mirror.


- Re-insert the counterweights.
- Lift the counterweight carriage with a screwdriver and remove the lower security screw.

**Warning!**

Make sure the bucky / tube carriage is still positioned on the red distance piece!

- Remove the upper red headed security screw.
- Secure the counterweight plates against tilting.
- Move the bucky / tube unit upwards and remove the red distance piece.
- Install the short hexagon screw and washer in the guiding rail.
- Re-install the covers.

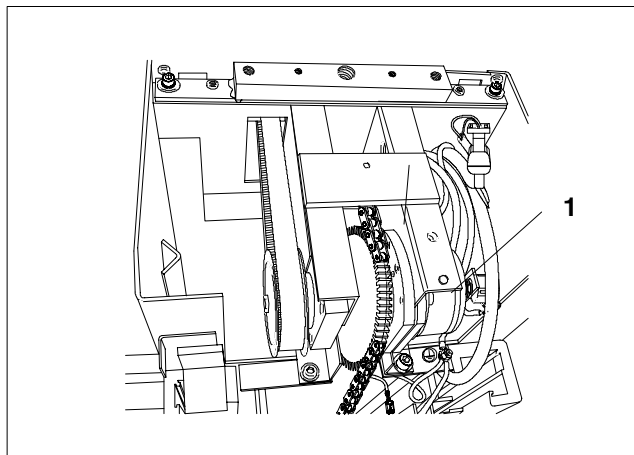
1.3.2. Replacement of the vertical brake UACX1**Code No. 4512 131 8748.**

 1 h	Replacement of the vertical brake UACX1	
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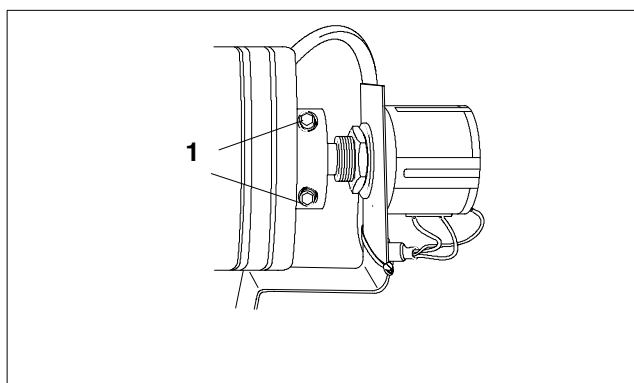
- Remove the top cover (10).

The figure shows an overview over the column top.

The brake is located at position (1).



- Dismount the potentiometer by loosening the two marked grub screws (1).

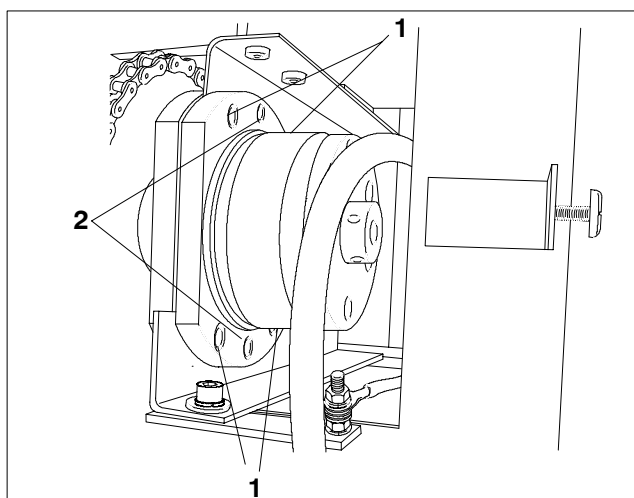


- Loosen the four screws (1) of the brake.
- Switch the system ON.

Note

Before the brake can be removed it has to be released with the respective button.


- Release the brake by pressing the up and down movement button at the control handle.
- Remove the brake.



If necessary, use a screwdriver to get the brake away from the bolts (2).

- Disconnect the cables of the old brake.
- Connect the cables to the new brake.
- Fix the new brake with the bolts (2).
- Make sure that the brake is tightened when the up and down movement button is released at the control handle.
- Install the potentiometer according to chapter 1.5.6.
- Connect the cables to the potentiometer.
- Set minimum and maximum CS / FS height in X-Scope.
- Re-install the cover.
- Check the functions.

1.3.3. Replacement of the vertical carriage**Code No. 4512 133 0321.**

 4 h	Replacement of the vertical carriage	
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- Remove the rear bottom cover (3) of the column.

**Warning!****DANGER OF INJURY!**

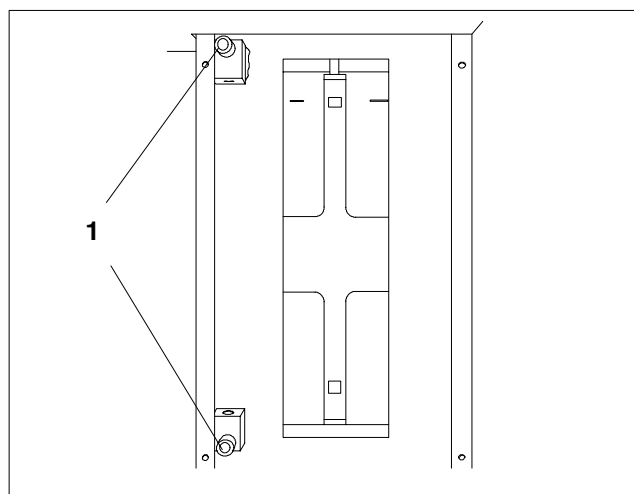
If the cover is removed, never put the hands or fingers inside until the system is blocked.

Insert the two “red head” security screws (1).

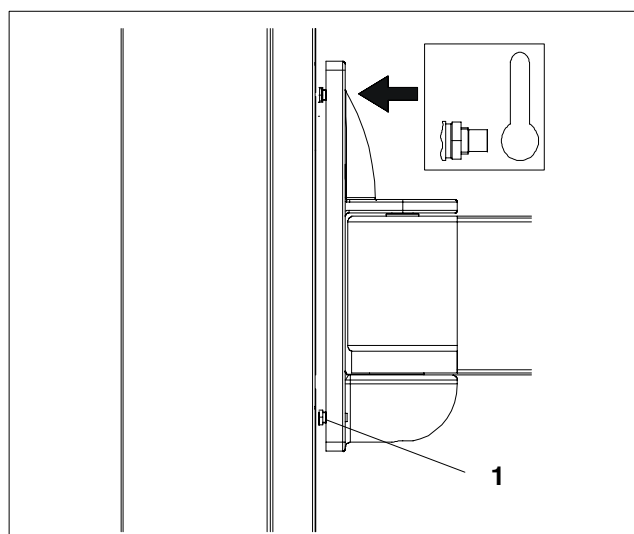
Note

Remove the security screws after the work is finished and place them back into their parking position!

- The counterweight carriage must be left secured with screws (1) until the tube arm and the counterweights are completely installed!




- Remove two screws (1) at the lower part of the carriage.
- Remove all cables.
- Remove the vertical carriage.
- Remove the chain fixation.
- Remove the end stopper at the top of the column.
- Remove the vertical carriage.
- Install the new vertical carriage.
- Install the end stopper at the top of the column.



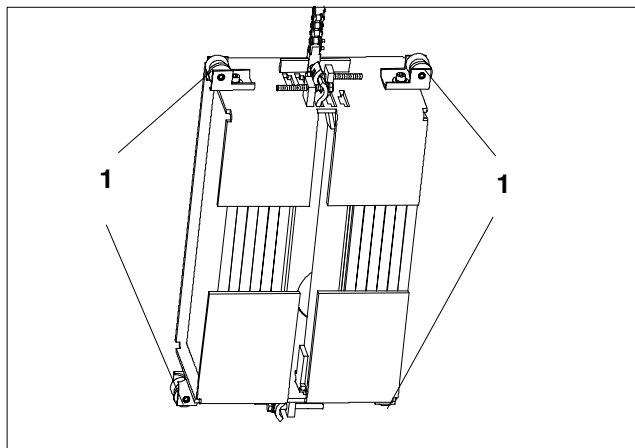
- Install the chain fixation with a new self-securing screw.
- Attach the removed tube arm.
- Connect all cables.
- Re-insert the removed screws (1).
- Remove the red headed security screws and install them in their parking position.
- Perform all necessary adjustment procedures.
- Check the functions of the system.
- Re-install the rear cover.

1.3.4. Replacement of the castor vertical carriage**Code No. 4512 133 0492.**

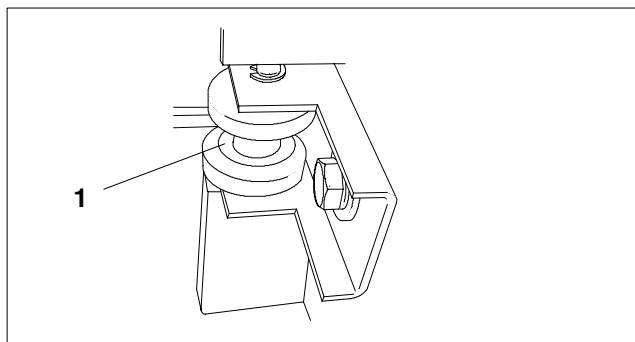
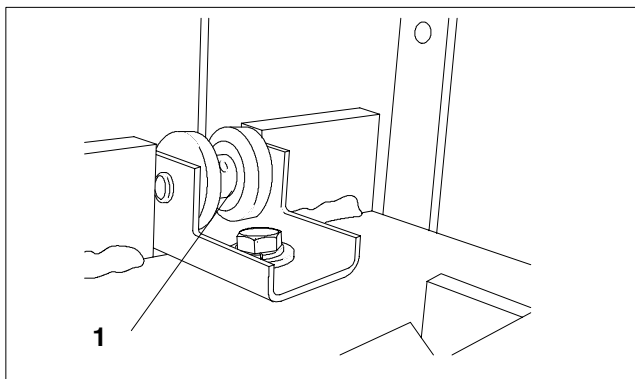
 1 h	Replacement of the castor vertical carriage	
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- Switch the system ON.
- Remove the rear bottom cover (3).


The four castors (1) are installed at the counterweight carriage and can be replaced from the rear side of the column.



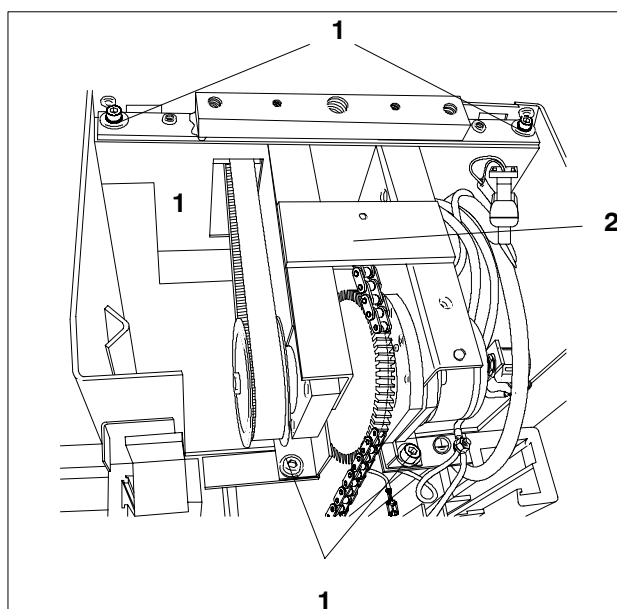
- Move the arm into a position from where the upper castors can be removed.
- Replace the upper castor (1) on both sides.
- Check the adjustments of the castors.
- Move the arm downwards to allow access to the lower castors.
- Replace the lower castor (1) on both sides.
- Check the adjustments of the castors.
- Ensure a smooth counterweight carriage up and down movement without any rattling noise.
- Re-install the cover.




1.3.5. Replacement of the sprocket wheel carrier**Code No. 4512 133 0327.**

 2 h	Replacement of the sprocket wheel carrier	
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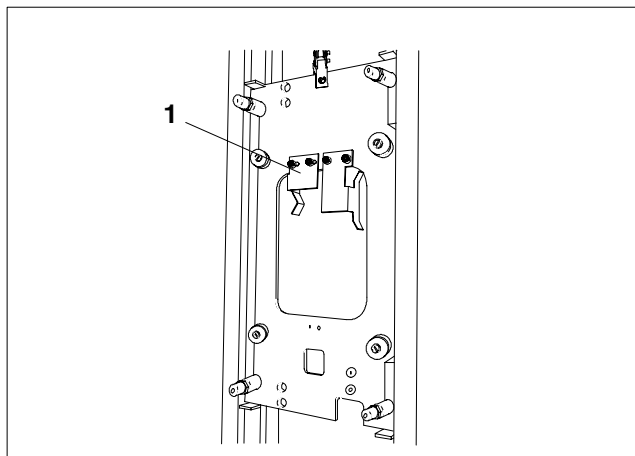
- Remove the top cover (10).
- Remove the chain according to chapter 1.2.1.
- Remove the tracking unit according to chapter 1.5.1.
- Remove the potentiometer and the brake cable according to chapter 1.5.5.
- Loosen the four screws (1).
- Replace the sprocket wheel carrier (2).
- Re-install potentiometer, brake cable, tracking unit and chain in reverse order as would be logical.
- Check the functions.
- Re-install the cover.



1.3.6. Replacement of the switch plate**Code No. 4512 133 0323.**

 4 h	Replacement of the switch plate	
---	------------------------------------	--


- Remove the front covers (1, 2).
- Remove the tube arm according to chapter 1.1.6.
- Replace the switch plate (1).
- Re-attach the tube arm according to chapter 1.6.1.
- Perform all necessary adjustment procedures.
- Check the function of the system.
- Re-install the covers.



1.4. Long tube carrier arm, fix

1.4.1. Replacement of the complete arm


Code No. 4512 131 8552.

 4 h	Replacement of the complete tube carrier arm	
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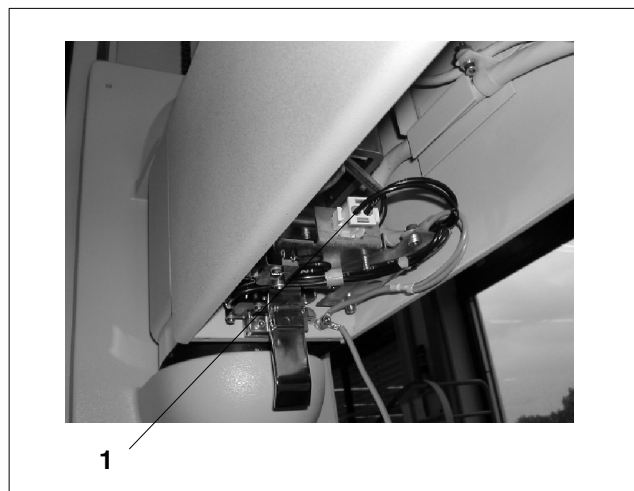
Refer to chapter 1.7.1 “Replacement of the complete tube carrier arm”, extendable with option tomo.

1.4.2. Replacement of the base plate installed micro switch

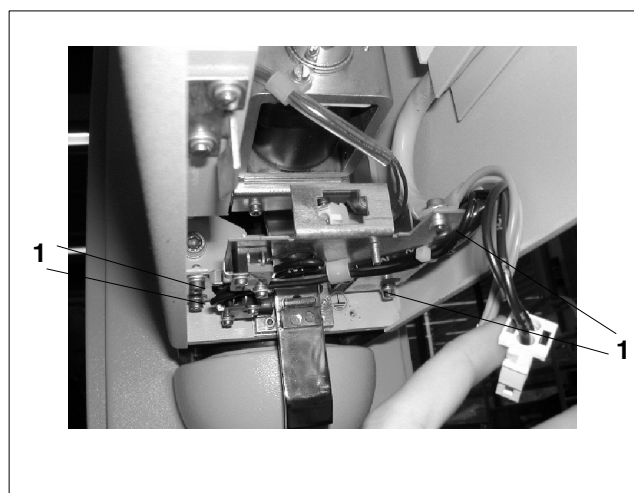
Code No. 4512 133 0593.

 0.5 h	Replacement of the base plate installed micro switch	
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- Remove the cover at the bottom of the tube carrier arm.
- Remove the connector (1).




- Loosen the four screws (1) and replace the base plate installed micro switch.
 - Ensure the correct function of the micro switch.



- Check the function of the system.
- Re-install the cover.

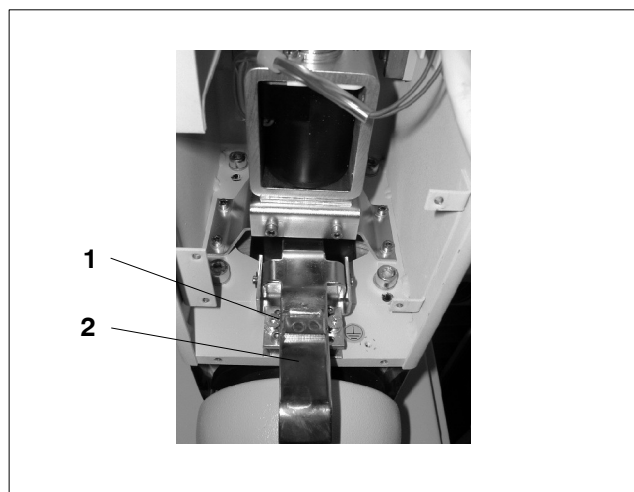
1.4.3. Replacement of the catch**Code No. 4512 133 0452.**

 0.5 h	Replacement of the catch	
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- Remove the cover at the bottom of the tube carrier arm.
- Remove the base plate installed micro switch according to chapter 1.4.2.

- Remove the screws (1) and replace the catch (2).

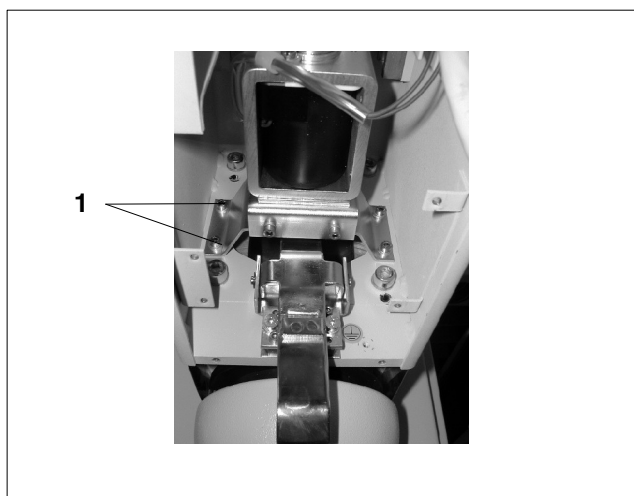
- Install the base plate installed micro switch according to chapter 1.4.2.




1.4.4. Replacement of the magnetic unit**Code No. 4512 133 0584.**

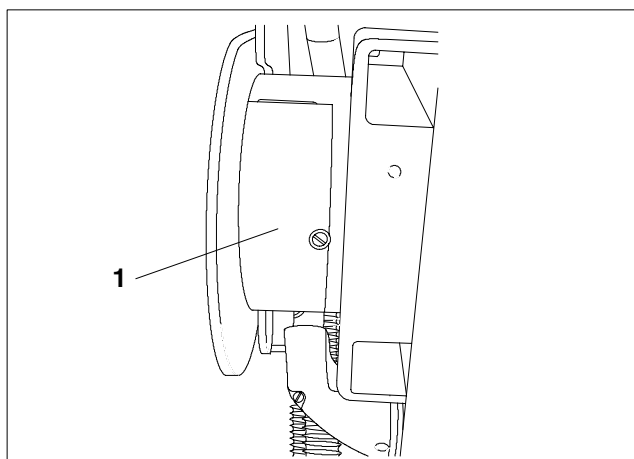
 0.5 h	Replacement of the magnetic unit	
---	----------------------------------	--

- Remove the cover at the bottom of the tube carrier arm.
- Remove the base plate installed micro switch according to chapter 1.4.2.
- Loosen the four screws (1) and replace the magnetic unit.
- Install the base plate installed micro switch according to chapter 1.4.2.

**1.4.5. Replacement of the alpha switch plate****Code No. 4512 13 1441.**

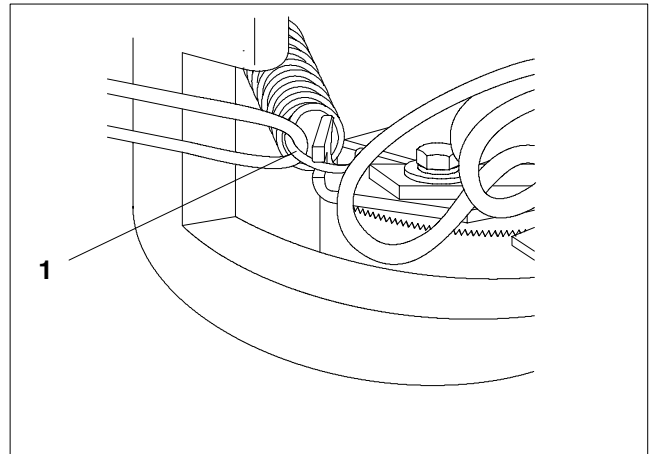
 1 h	Replacement of the alpha switch plate	
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- Switch the system OFF.
- Turn the control handle clockwise to its end position.
- Remove the cover (1).

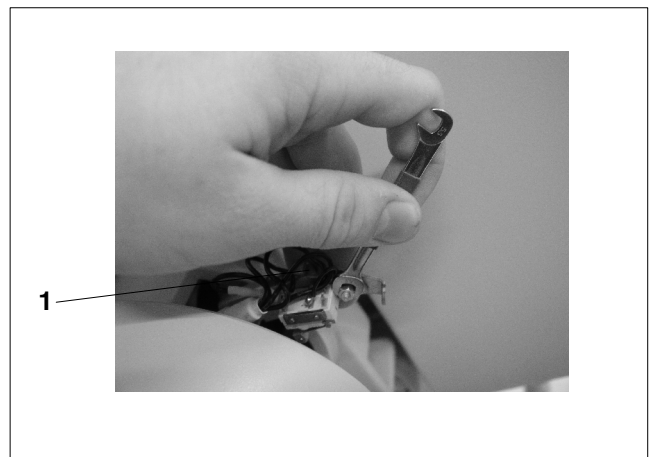


Use a wire and pliers for easier handling of the tension spring.

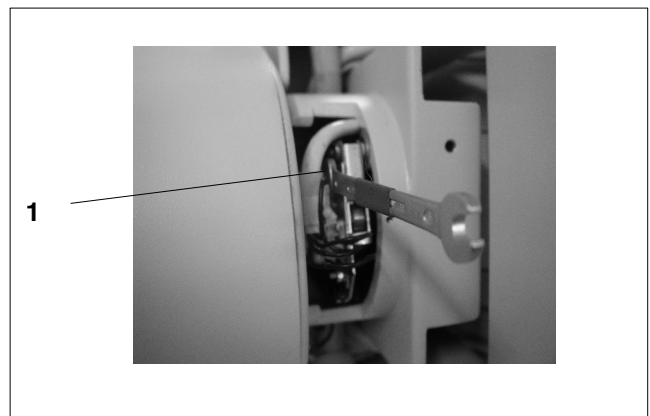
- Unhook the spring at its top (1).



- Remove the nut (1).



- Remove the upper screw of the alpha switch plate (1)



- Pull out the alpha switch plate and remove the wires.

Note

Do not touch the fixing screws (1).

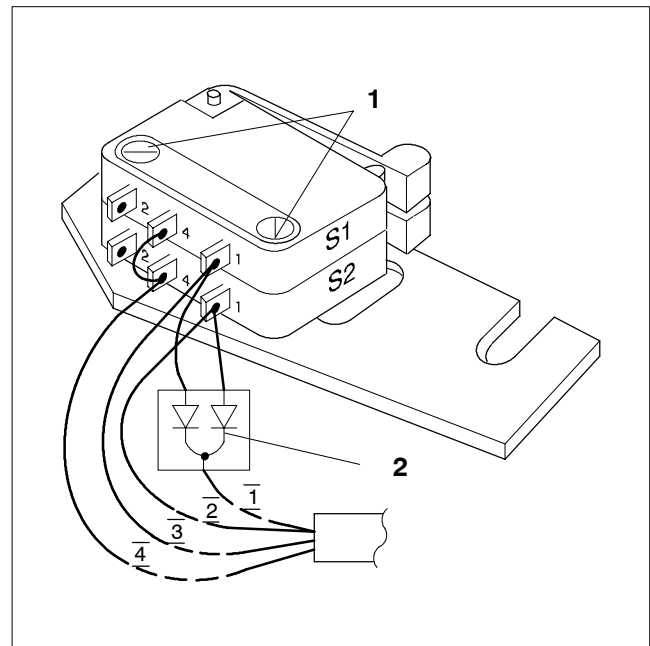
- Solder in the new alpha switch plate at the wires according the following table.
 - Pay attention to the diode (2).

Labeled wires connected to:		
UEX4:02	<u>1</u>	the cathode of both diodes
UEX4:08	<u>3</u>	UFA S1:1
UEX4:09	<u>4</u>	UFA S1:4
UEX4:04	<u>2</u>	UFA S2:1

- Insert and fix the alpha switch plate.
- Hook in the spring.
- Switch the system ON.
- Ensure the 0°, +90° and -90° positions at control handle according to table.
 - The LED is illuminated only in 0°, +90° and -90° positions.

S1	S2	degree
ON	ON	0
ON	OFF	+90
OFF	ON	-90


- Re-install the cover.



1.5. Long tube carrier arm, extendable

1.5.1. Replacement of the complete arm


Code No. 4512 131 8753.

 4 h	Replacement of the complete tube carrier arm	
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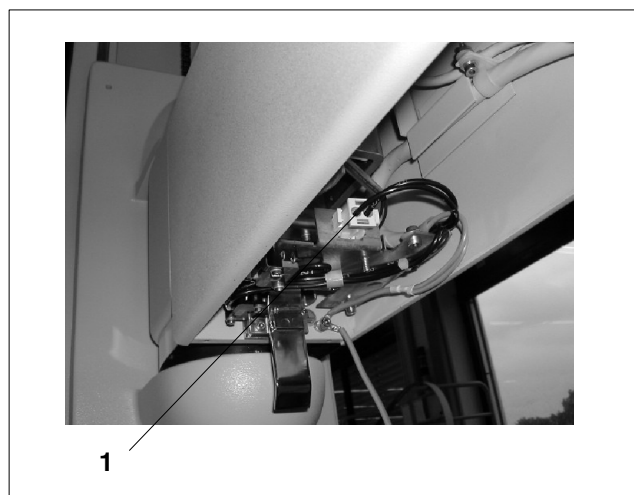
Refer to chapter 1.7.1 "Replacement of the complete tube carrier arm", extendable with option tomo.

1.5.2. Replacement of the base plate installed micro switch

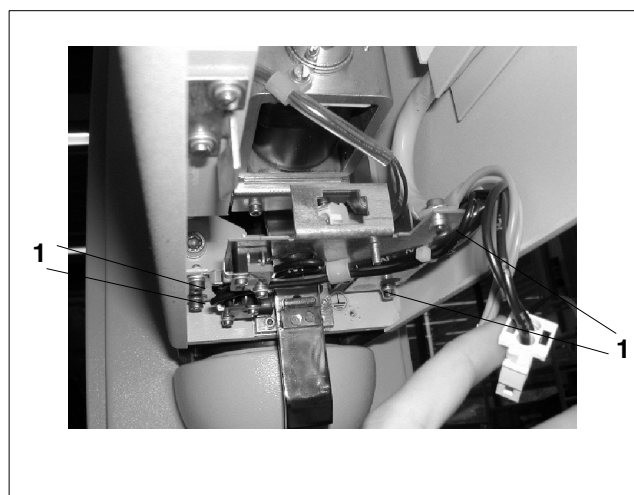
Code No. 4512 133 0544.

 0.5 h	Replacement of the base plate installed micro switch	
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- Remove the cover at the bottom of the tube carrier arm.
- Remove the connector (1).




- Loosen the four screws (1) and replace the base plate installed micro switch.
 - Ensure the correct function of the micro switch.

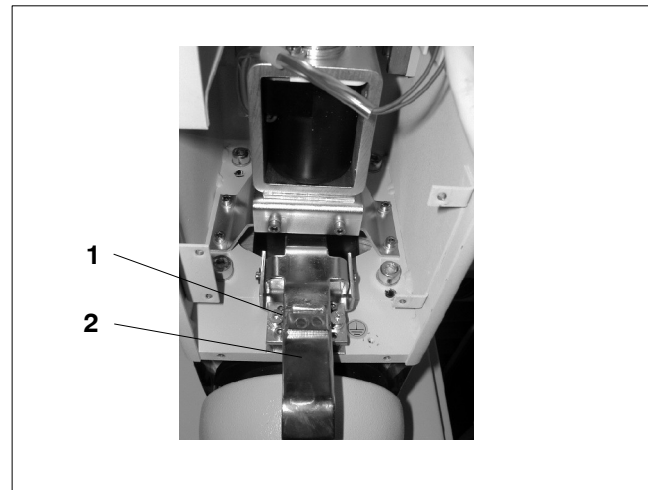


- Check the function of the system.
- Re-install the cover.


1.5.3. Replacement of the catch**Code No. 4512 133 0452.**

 0.5 h	Replacement of the catch	
---	-----------------------------	--

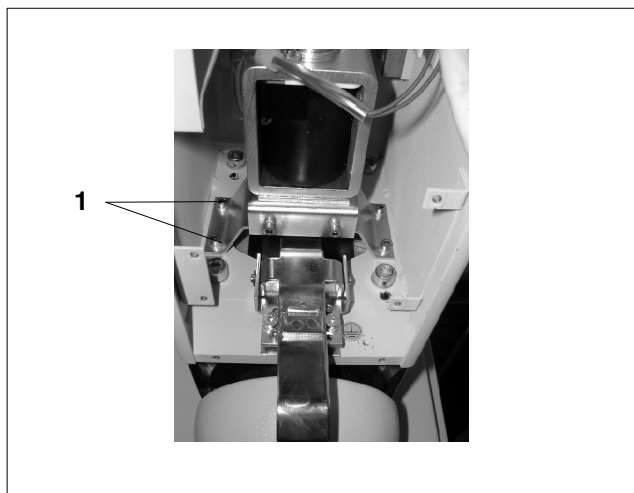
- Remove the cover at the bottom of the tube carrier arm.
- Remove the base plate installed micro switch according to chapter 1.5.2.
- Remove the screws (1) and replace the catch.
- Install the base plate installed micro switch according to chapter 1.5.2.



1.5.4. Replacement of the magnetic unit**Code No. 4512 133 0584.**


 0.5 h	Replacement of the magnetic unit	
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- Remove the cover at the bottom of the tube carrier arm.
- Remove the base plate installed micro switch according to chapter 1.5.2.
- Loosen the four screws (1) and replace the magnetic unit.




- Install the base plate installed micro switch according to chapter 1.5.2.

1.5.5. Replacement of the alpha switch plate**Code No. 4512 13 1441.**

 1 h	Replacement of the alpha switch	
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- Replace the alpha switch plate according to chapter 1.4.5.

1.5.6. Replacement of the transverse brake**Code No. 4512 130 7291.**

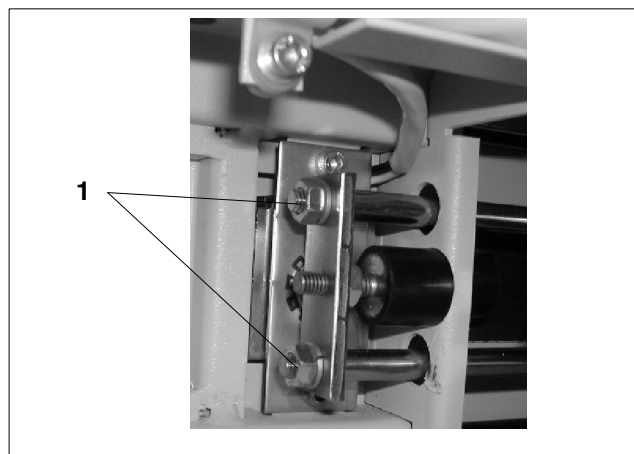
 1 h	Replacement of the transverse brake	
---	--	--

- Switch the system OFF.
- Remove the bottom cover of the tube carrier arm.
- Pull out the tube carrier arm to its maximum size.

**Warning!**

If the end stopper is removed the tube carrier arm can fall down. Secure the tube carrier arm, e.g. by lifting the table.

- Remove the end stopper by loosening the screws (1).

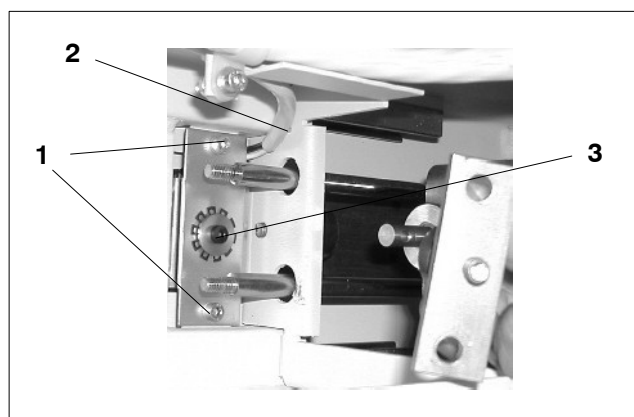


- Remove the screws (1) from the brake plate.

Note

Keep in mind the positions of the cable!

- Remove the cable (2).
- Replace the brake (3) at the brake plate.



- Solder on the cable.
- Fix the cable at the tube carrier arm.
- Fix the end stop.
- Check the function of the brake.
- Re-install the cover.


1.6. Control grip

1.6.1. Replacement of the PCB control handle CU2

Code No. 4512 108 0718.

Note


After replacement of the CU2 proceed with the height adjustment. Refer to chapter 10.2 "Adjustment of the ceiling suspension height" in manual X-Scope.

 1 h	Replacement of the PCB on the control handle	
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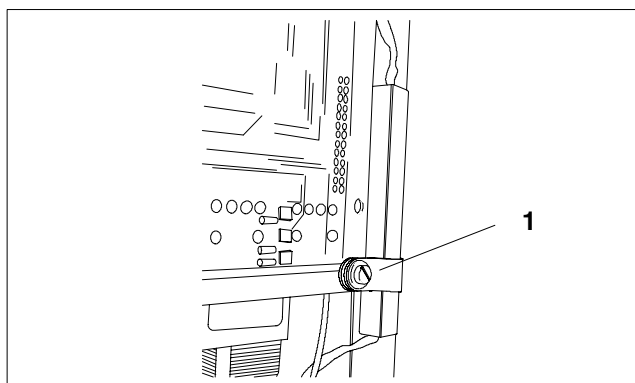
1.7. Option tracking

1.7.1. Replacement of the tracking unit

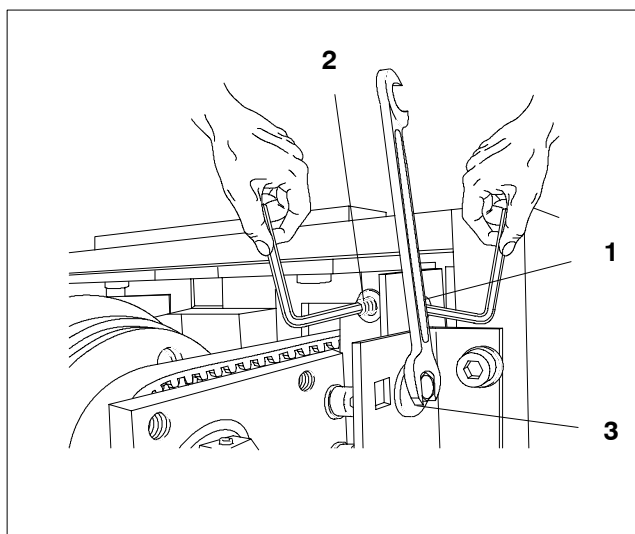
Code No. 4512 133 0671.

 1 h	Replacement of the tracking unit	
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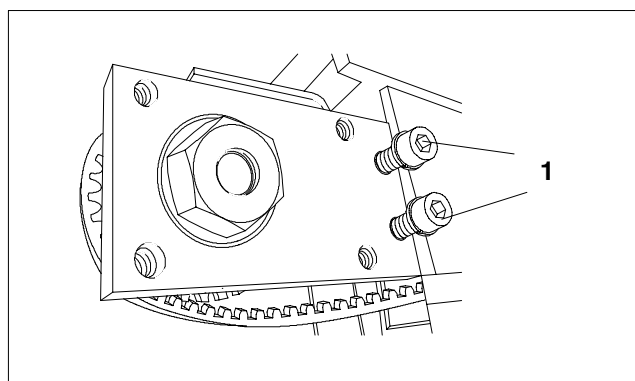
- Switch the system OFF.
- Remove the electronic rack cover and the top cover (**5, 10**).
- Loosen the clamp of the resistor (**1**).



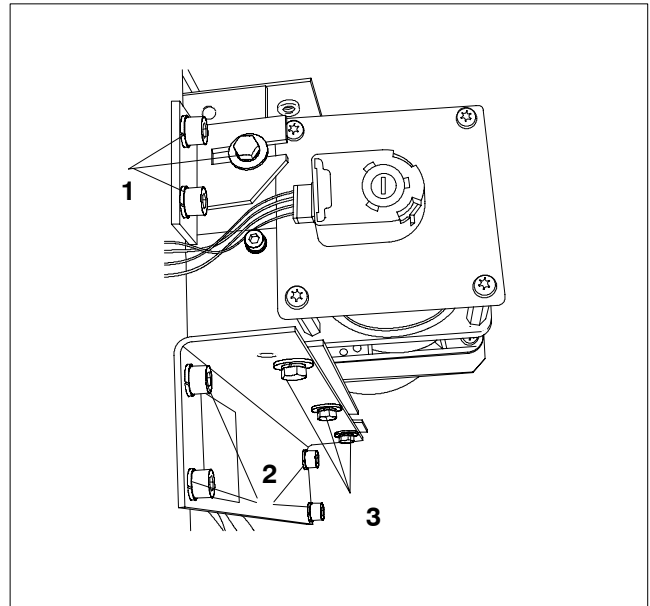
- Loosen the tension screws (**1, 2, 3**) on both sides of the tracking unit (2x).



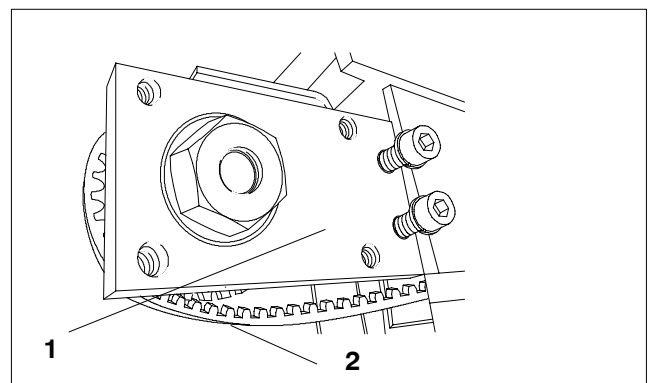
- Remove the screws (**1**).



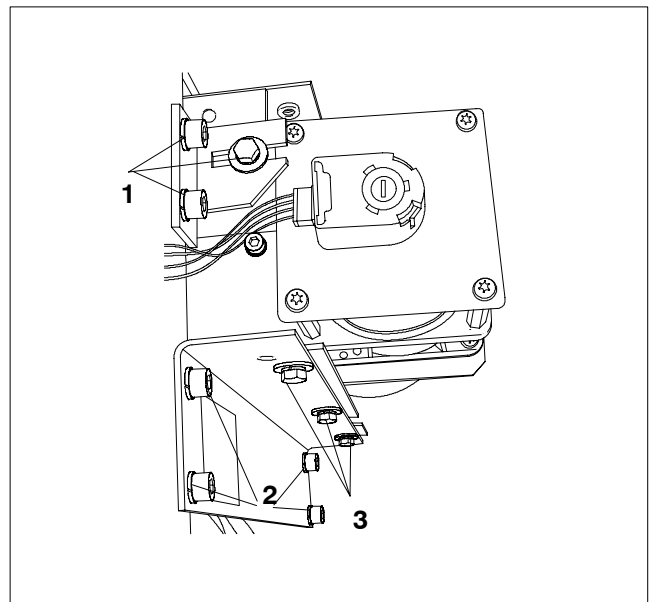
- Loosen the screws (1,2,3).



- Dismantle the plate (1) and the toothed belt (2) from the tracking unit mandrel.

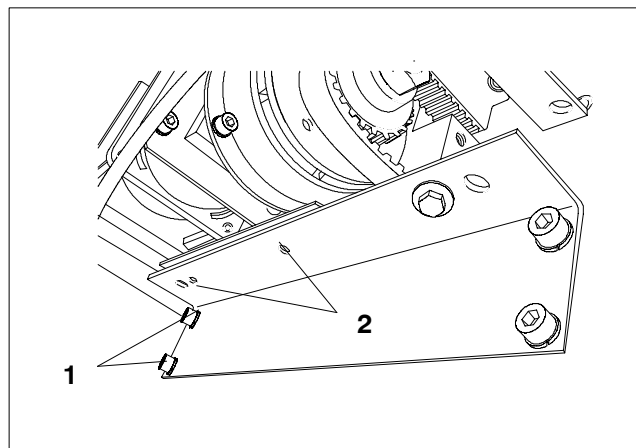


- Remove the screws (1, 2, 3).

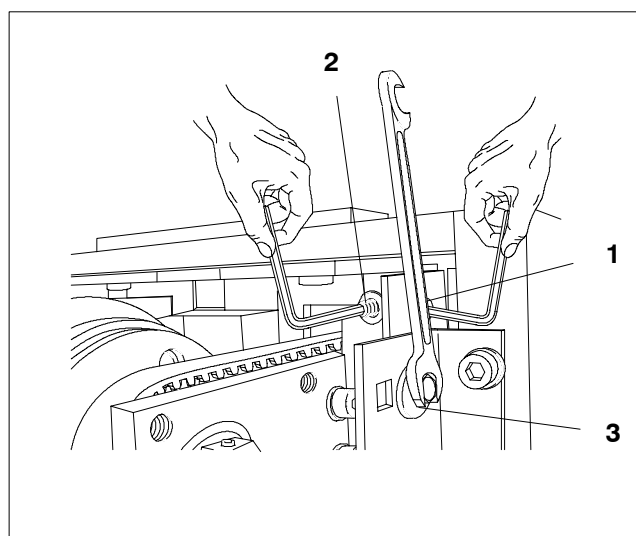


- Replace the tracking unit.

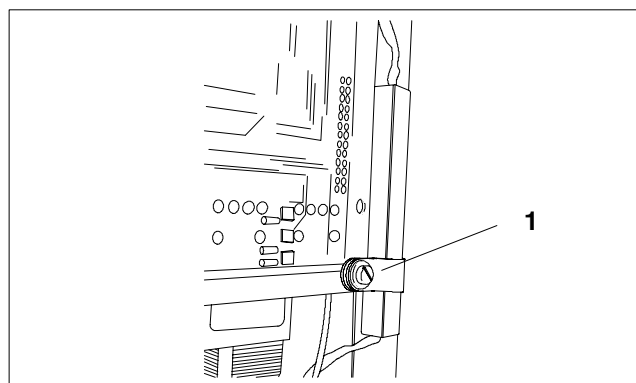
- Insert new screws (1) but do not tighten them.
- Use the marked holes (2) for the connection of the two holders.



- Insert the toothed belt.
- Tighten all screws, except the screws for the belt tension.
- Tighten the belt with screw (2) on both sides.
- Tighten the screws (1, 3) on both sides.




- Connect all cables and the resistor clamp (1).

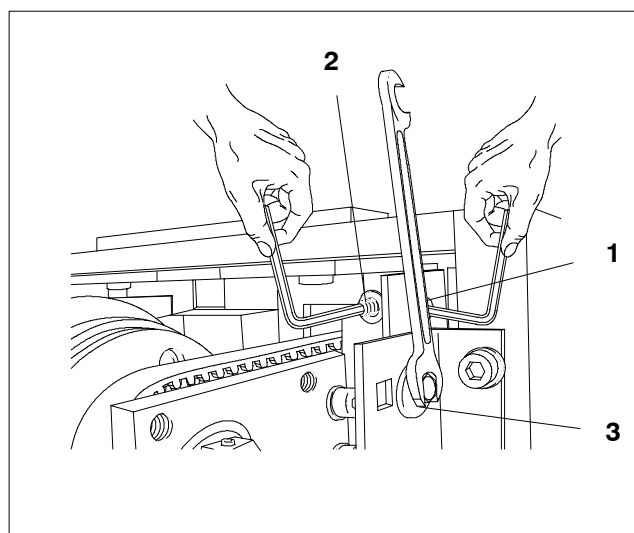


- Set the parameters “Minimum” and “Maximum” CS/FS height in X-Scope.
- Re-install the covers.
- Check the functions of the system.

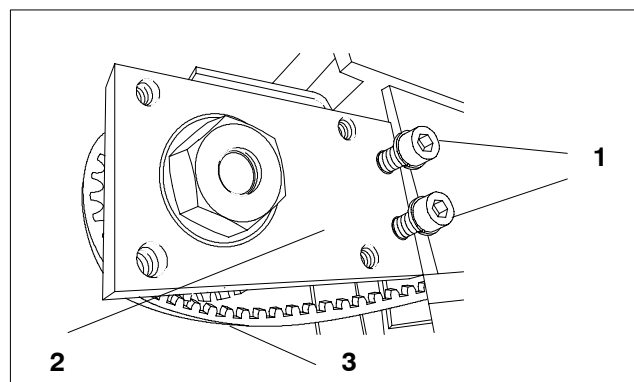
1.7.2. Replacement of the toothed belt**Code No. 4512 131 4553.**

 1.5 h	Replacement of the toothed belt	
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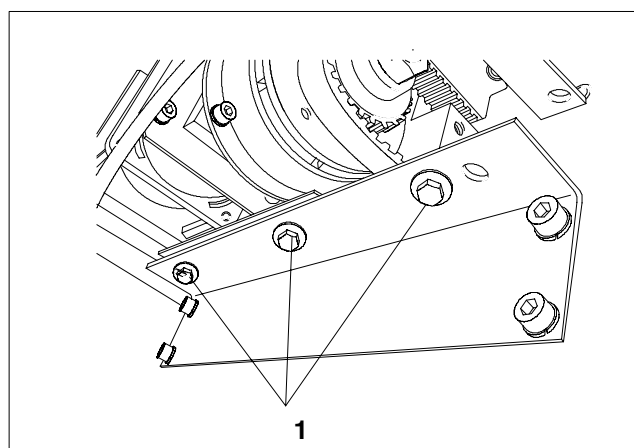
- Switch the system OFF.
- Remove the electronic rack cover and the top cover (5, 10).
- Loosen the tension screws on both sides of the tracking unit.



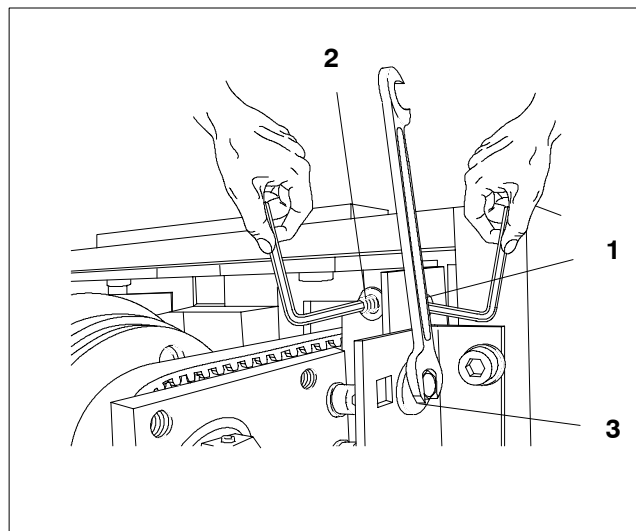
- Remove the two screws (1).
- Dismantle the plate (2) and the toothed belt (3) from the tracking unit mandrel.




- Remove the three screws (1).



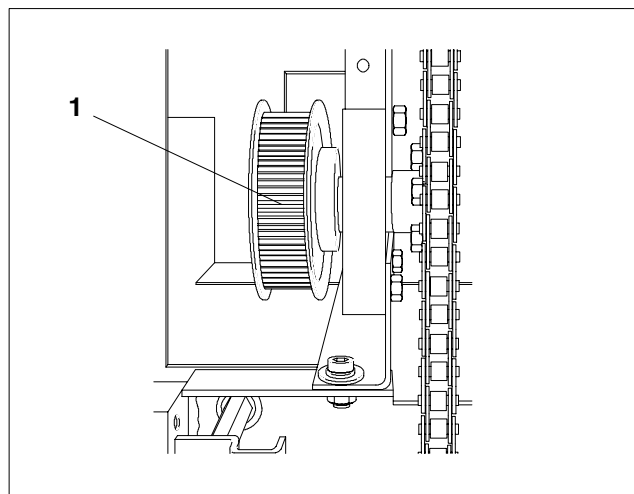
- Replace the toothed belt.
- Install the plate of the tracking unit mandrel.
- Tighten all screws, except the screws for the belt tension.
- Tighten the belt with the screw (1) on both sides.
- Tighten the screws (2, 3) on both sides.
- Set the parameters “Minimum” and “Maximum” CS/FS height in X-Scope.
- Re-install the covers.
- Check the functions of the system.




1.7.3. Replacement of the toothed belt disk**Code No. 4512 133 0665.**

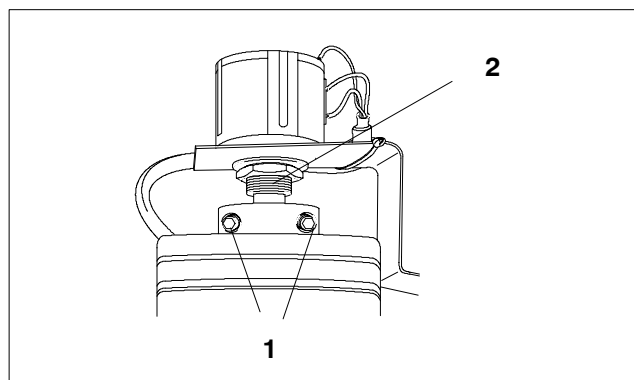
 2 h	Replacement of the toothed belt disk	
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- Remove the toothed belt. Refer to chapter 1.5.3.
- Replace the disk (1).
- Re-install the toothed belt according to the instructions in chapter 1.5.3.

**1.7.4. Replacement of the potentiometer****Code No. 4512 13 8721.**

 1.5 h	Replacement of the potentiometer	
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- Remove the electronic rack cover and the top cover (5, 10).
- Position the arm in such a way that the grub screws of the potentiometer can be loosened.
- Switch the system OFF.
- Loosen the grub screws (1).



- Disconnect the potentiometer cable from the position Z-field.
- Remove the potentiometer.

- Move the tube arm to its uppermost position.
- Turn the potentiometer mandrel counterclockwise up to the mechanical stop.
- Turn the potentiometer mandrel (2) 90° clockwise.
- Install the potentiometer.
- Connect the potentiometer cable.
- Re-install the covers.
- Set the parameters “Minimum-” and “Maximum CS height” in X-Scope.
- Check the functions of the system.

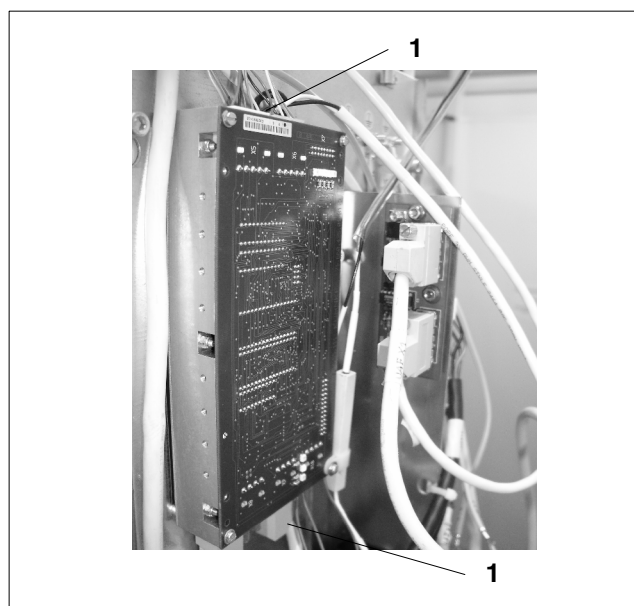
1.7.5. Replacement of the motor controller**Code No. 4512 130 2316.**

 4 h	Replacement of the motor controller	
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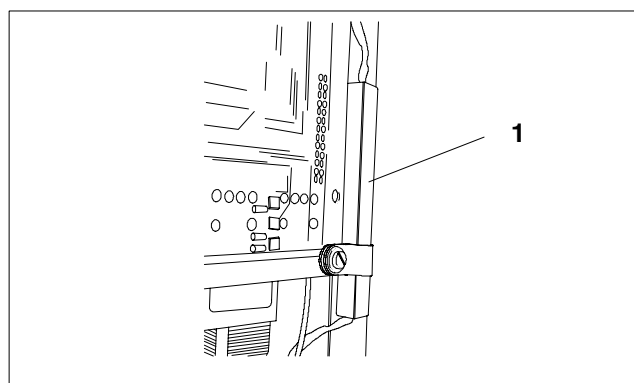
- Switch the system OFF.
- Remove the electronic rack cover (5) from the column.

Note*Keep in mind the position of the connectors!*


- Remove all connectors (1) from the motor controller.



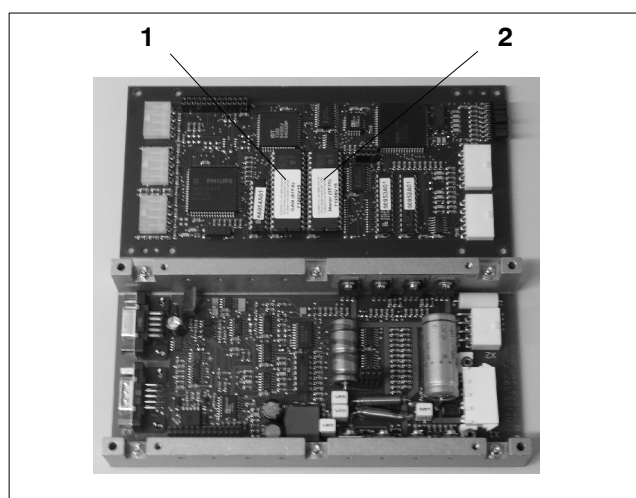
- Remove the motor controller from the column. Pay attention to the resistor (1).
- Install the new motor controller at the column.
- Fix the resistor at the motor controller (1).
- Insert the connectors in their correct position.
- Check the function of the system.
- Re-install the cover.



1.7.6. Replacement of the firmware**Code No. 4512-130-2343.**


 4 h	Replacement of the firmware	
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- Remove the motor controller according to chapter 1.6.5.
- Remove the upper PCB board from the motor controller.
- Replace the firmware (1, 2).

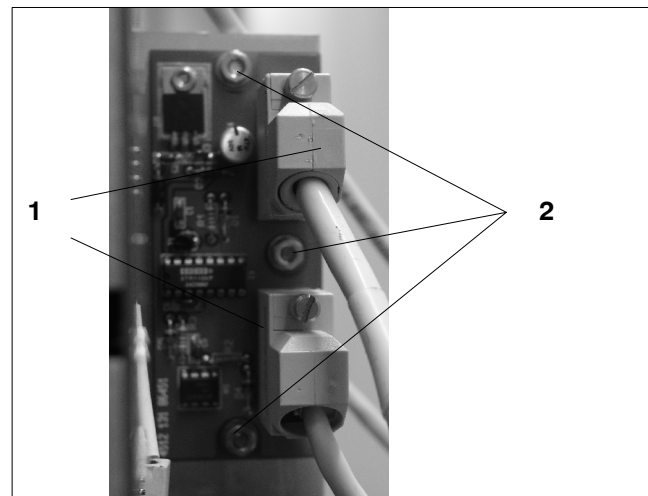


- Place the upper PCB board on the motor controller.
- Install the motor controller according to chapter 1.6.5.
- Check the function of the system.
- Re-install the cover.

1.7.7. Replacement of the Z-position plate Code No. 4512 131 8645.

 1 h	Replacement of the Z-position plate	
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- Switch the system OFF.
- Remove the electronic rack cover (5) of the column.
- Remove the connectors (1) from the Z-position plate.
- Loosen the screws (2) and replace the Z-position plate.
- Insert the connectors in their correct position.
- Check the function of the system
- Re-install the cover.





1.8. Option Tomo

1.8.1. Replacement of the complete telescopic arm with option tomo

Code No. 4512 131 8753.

- Remove the rear bottom cover (3) of the column.

 4 h	Replacement of telescopic arm with option tomo	 4 h
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Warning!

DANGER OF INJURY!

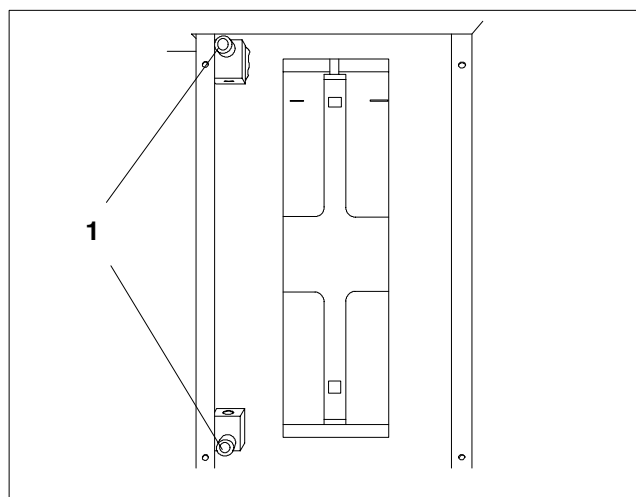
If the cover is removed, never put the hands or fingers inside until the system is blocked.

Insert the two "red headed" security screws (1).

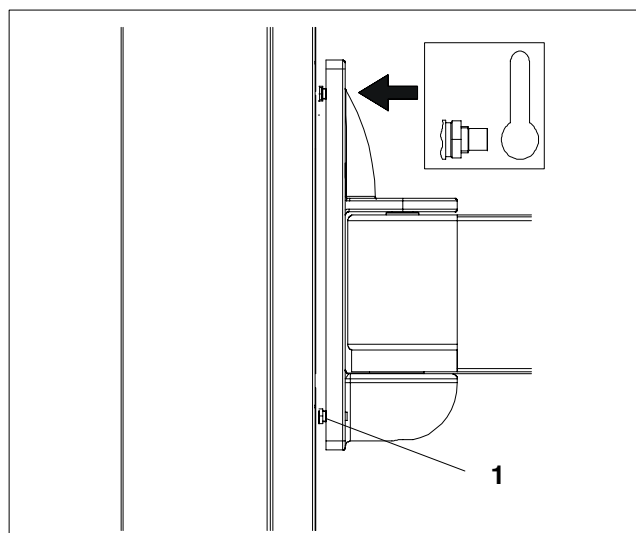
Note

Remove the security screws after the work is finished and place them back into their parking position!


- The counterweight carriage must be left secured with screws (1) until the tube arm and the counterweights are completely installed!



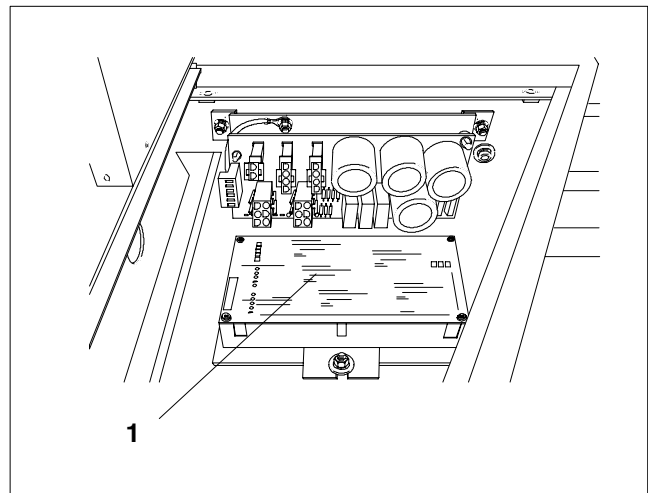
- Remove two screws (1) at the lower part of the carriage.
- Remove all cables.
- Remove the tube arm.
- Attach the new tube arm.
- Connect all cables.
- Re-insert the removed screws (1).
- Remove the red head security screws and install them in their parking position.
- Do all necessary adjustment procedures.
- Check the function of the system.
- Re-install the cover.




1.8.2. Replacement of the motor controller UBN2**Code No. 4512 130 2316.**

 0.5 h	Replacement of motor controller UBN2	
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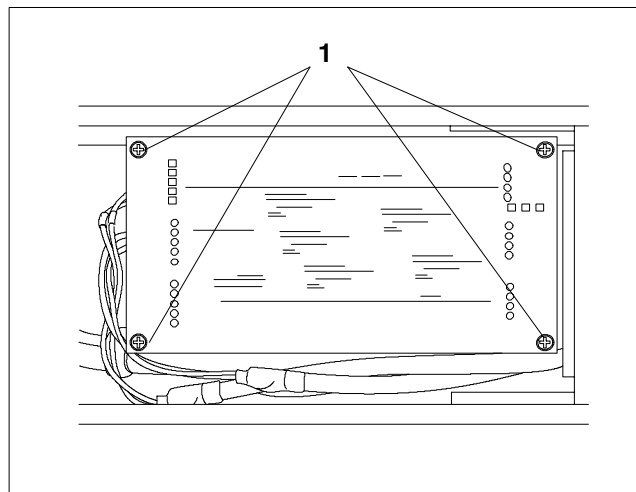
- Remove the column base top cover at the right side **(6)**.
- Remove the cables from the motor controller.
- Replace the motor controller **(1)**.
- Connect the cables.
- Check the functions of the system.
- Re-install the cover.



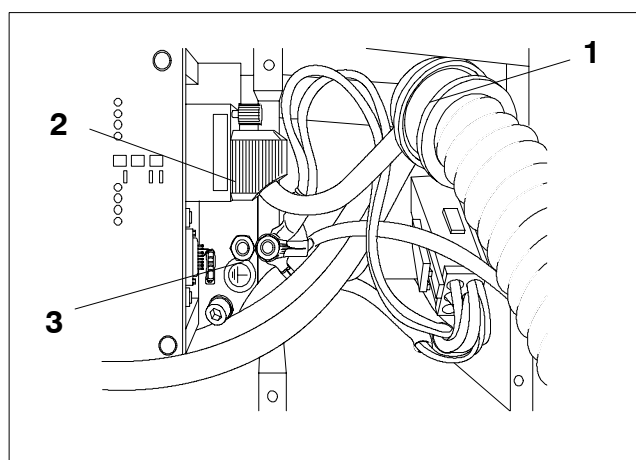
1.8.3. Replacement of the tomo 2 alpha drive**Code No. 4512 131 8755.**

 1.5 h	Replacement of the tomo 2 alpha drive	
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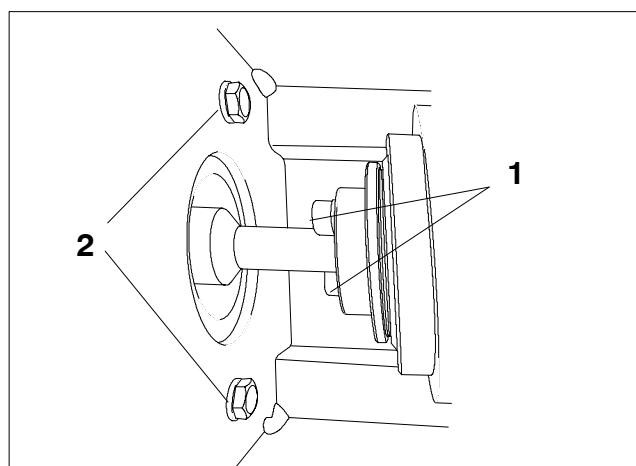
- Remove the cover at the bottom of the tube carrier arm.
- Remove the cables.
- Disconnect the motor controller by loosening the four screws (1).
- Remove the motor controller.



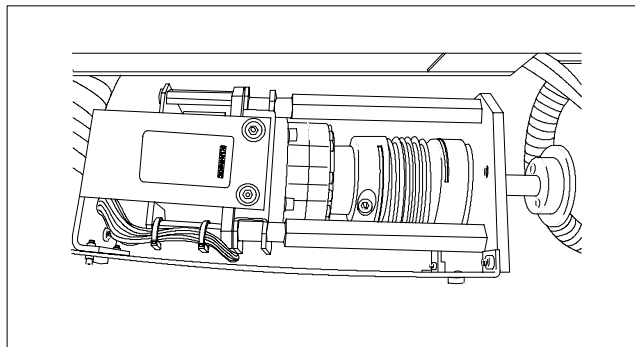
- Disconnect the clamp (1) and the cables (2, 3).



- Loosen the screws of the motor shaft (1) and from the motor controller (2).



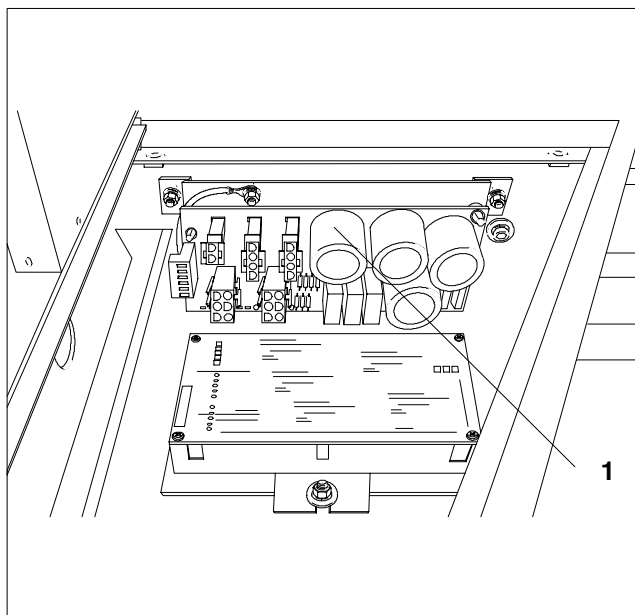
- Replace the alpha motor according to the figure.
- Re-install the motor controller.
- Connect the cables.
- Check the function of the system.
- Re-install the cover.




1.8.4. Replacement of the tomo safety circuit Code No. 4512 131 1814.

	Replacement of tomo safety circuit board	
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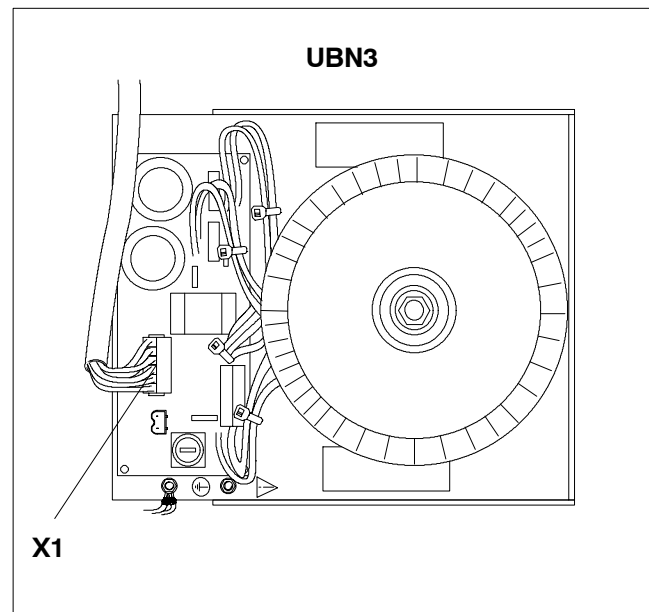
- Remove the floor carriage cover at the right side (6).
- Disconnect the cables from the tomo safety circuit board **UBN1** (1).
- Replace the tomo safety circuit board **UBN1**.
- Connect the cables.
- Check the function of the system.
- Re-install the cover.




1.8.5. Replacement of the tomo power supply UBN3**Code No. 4512 131 1810.**

 0.5 h	Replacement of tomo power supply UBN3	
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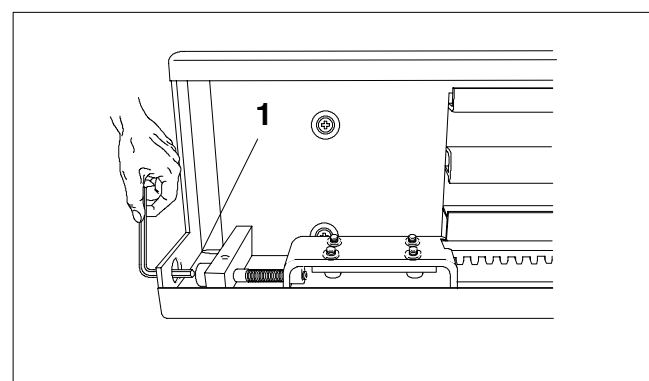
- Remove the column base top cover at the left side **(6)**.
- Disconnect the cables from the tomo **UBN3X1**.
- Replace the tomo power supply **UBN3**.
- Connect the cables to **UBN3X1**.
- Check the function of the system.
- Re-install the cover.

**1.8.6. Replacement of the tomo motor****Code No. 4512 130 2315.**

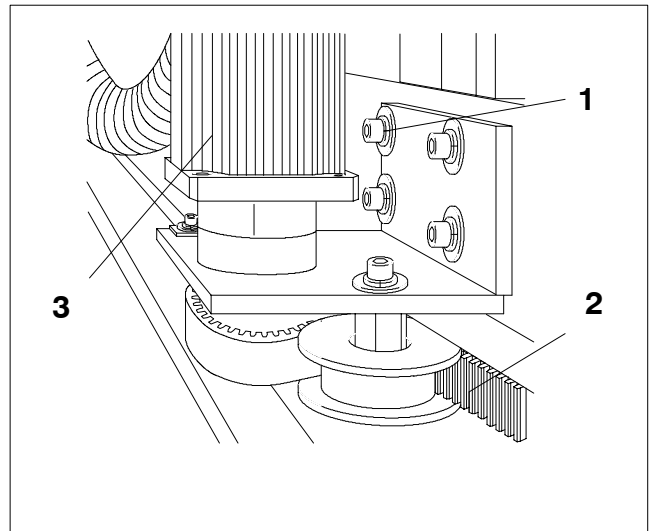
 1 h	Replacement of tomo motor	
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- Remove the column base rear cover **(7)**.
- Disconnect the cables and keep in mind the positions of the connectors .

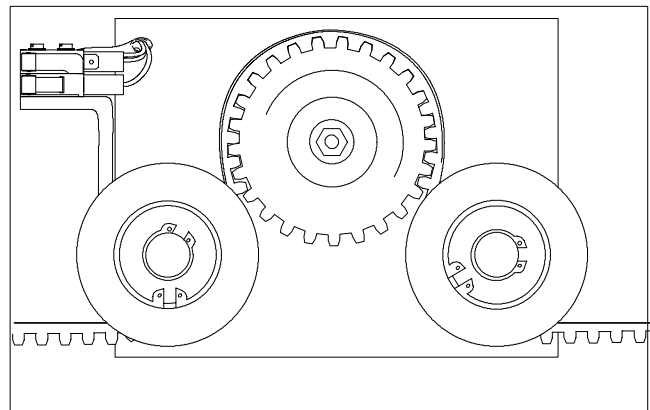
- Loosen the screw **(1)** and remove the tomo belt from the tightening block.



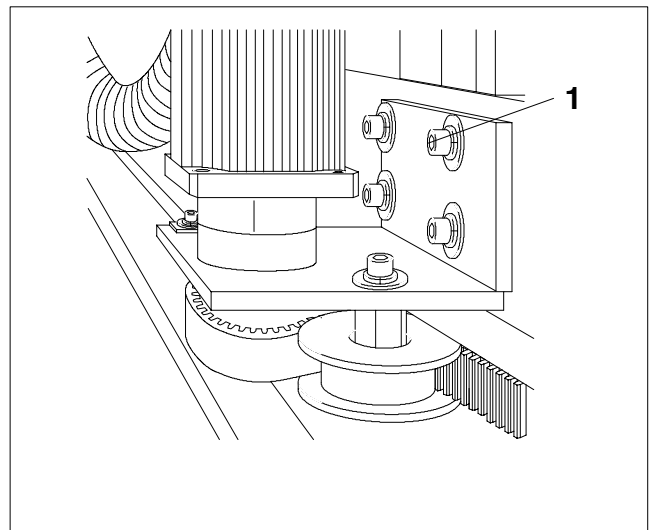
- Loosen the four screws (1).
- Remove the tomo belt (2) from the tomo rail.
- Remove the old tomo motor (3).



- Turn the new tomo motor and insert the belt as shown.



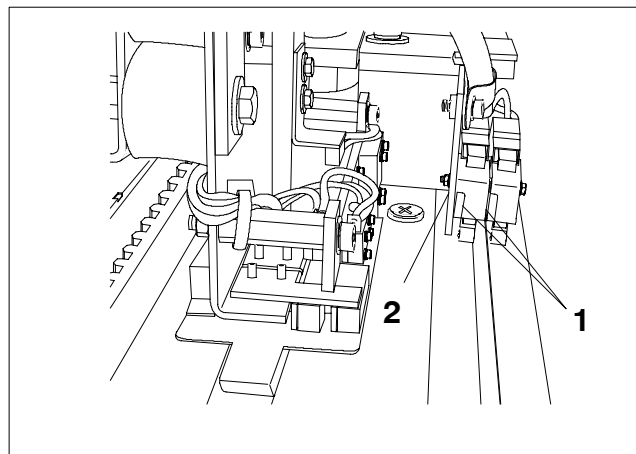
- Fix the tomo unit with the four screws (1).



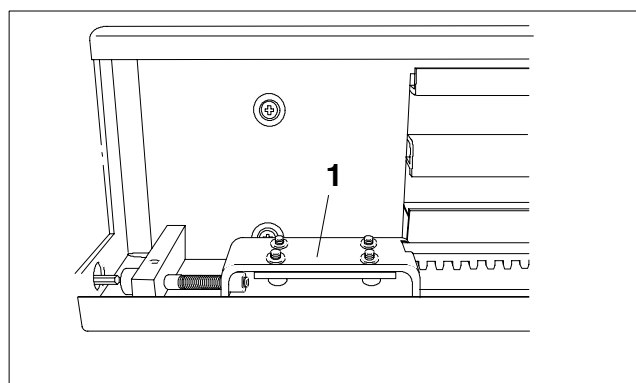
Note

The tomo unit must be positioned in such a way that the respective switch (1) only touches its corresponding switching cam.

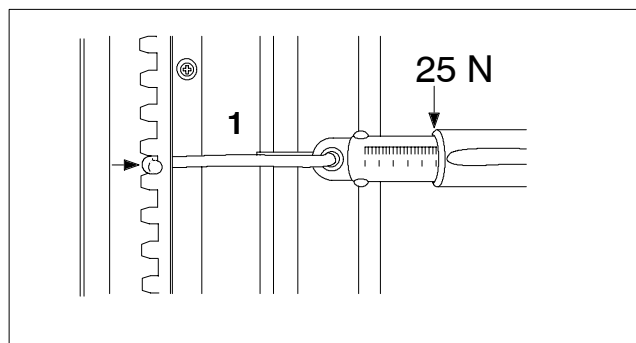
- The adjustment of the switches can be done by shifting the switching cam holder (2).



- Fix the toothed belt at the tightening block (1) so that one tooth remains outside.




- Adjust the tomo belt tension.
 - Move the column to its end position.
 - Check the tension of the belt at the tomo center position with a spring balance.
 - Pull the belt to the groove (1) with a force of 25 N.



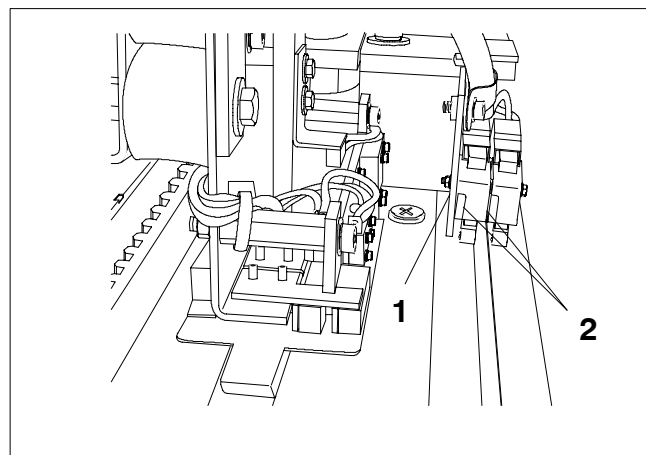
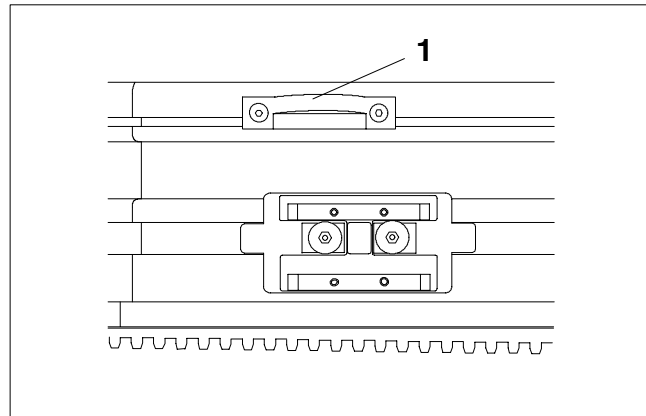
- Check the function of the system.

- Re-install the cover.


1.8.7. Replacement of the tomo center switch cam**Code No. 4512 133 0635.**

 0.5 h	Replacement of the tomo center switch cam	
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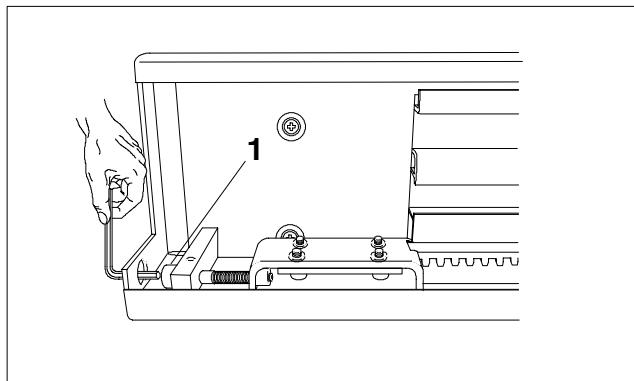
- Move the carriage into the opposite position.
- Remove the tomo switch cam.
- Install the tomo center cam (1) in such a way that the catch plate can still be moved along the rails.
- Move the column into the table center position.
- Use the laser of the control handle to adjust the bucky center position.
- Mark the tomo center cam position.
- Fix the center catch plate.
- Move the column into the system center position. The pin of the catch locks into the catch plate.
- Position the switching cam holder (1) of the tomo center position to the switch (2).
- Fix the switch cam.
- Check the correct adjustment of the switches.
 - The switches are adjusted correctly if the respective switching cam touches only the respective switch.



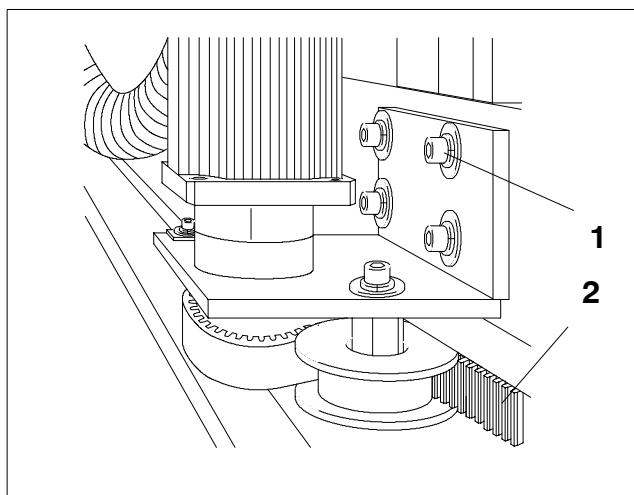
1.8.8. Replacement of the installed tomo belt Code No. 4512 133 0640.

 1 h	Replacement of the installed tomo belt	
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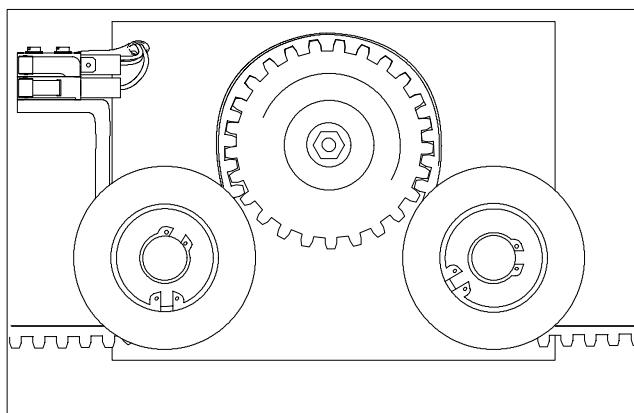
- Remove the column base rear cover (7).
- Loosen the screw (1) and remove the tomo belt from the tightening block.



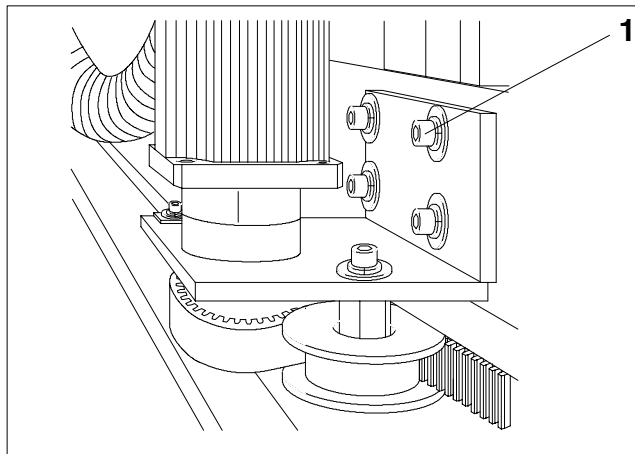
- Loosen the four screws (1).
- Remove the tomo belt (2) from the tomo rail.



- Insert the new tomo belt into the tomo motor as shown.

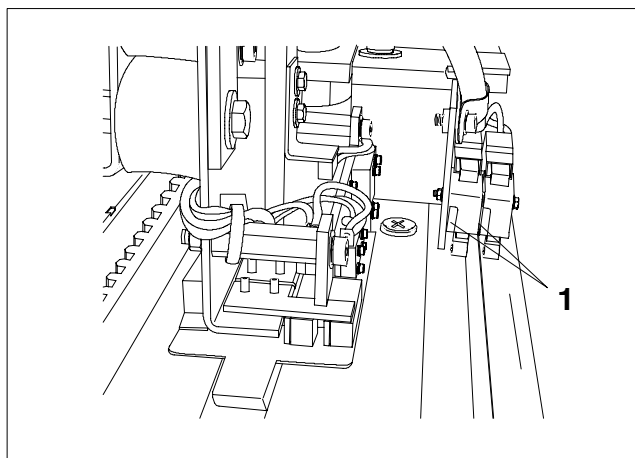


- Fix the tomo unit with the four screws (1).

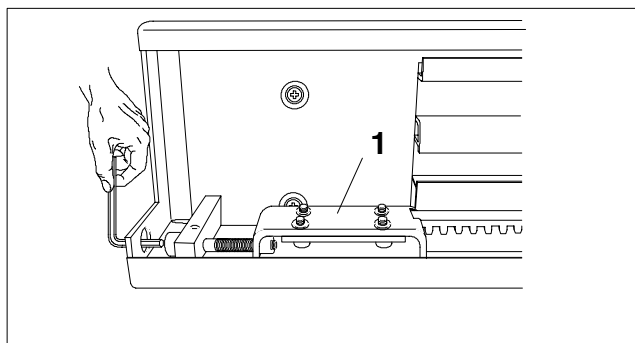


Note

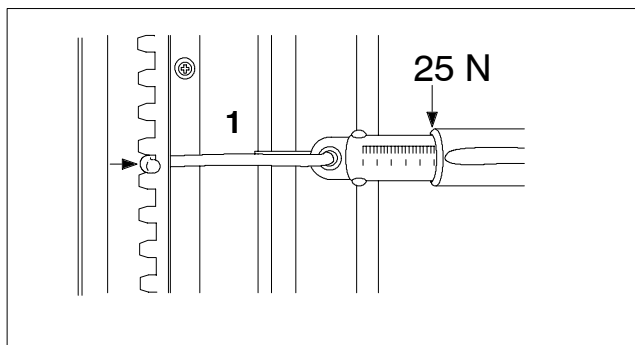
The tomo unit must be positioned in such a way that the respective switch (1) only touches its corresponding switching cam.



- Fix the toothed belt at the tightening block (1) so that one tooth remains outside.




- Adjust the tomo belt tension.
 - Move the column to its end position.
 - Check the tension of the belt at the tomo center position with a spring balance.
 - Pull the belt to the groove (1) with a force of 25 N.

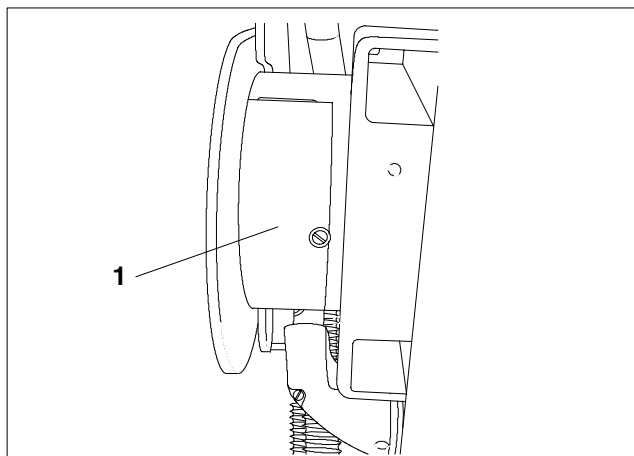


- Check the function of the system.
- Re-install the cover.

1.8.9. Replacement of the tomo tension spring**Code No. 4512 917 9009.**

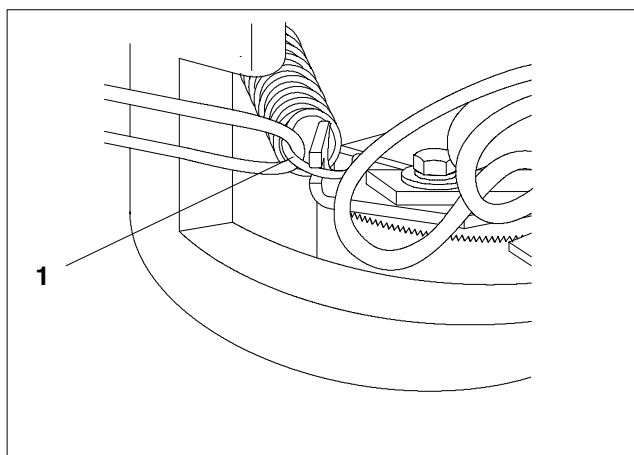
 1 h	Replacement of the tomo tension spring	
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- Switch the system OFF.
- Turn the control handle clockwise to its end position.
- Remove the cover (1).




Use a wire and pliers for easier handling of the tomo tension spring.

- Unhook the tomo tension spring at its top (1).

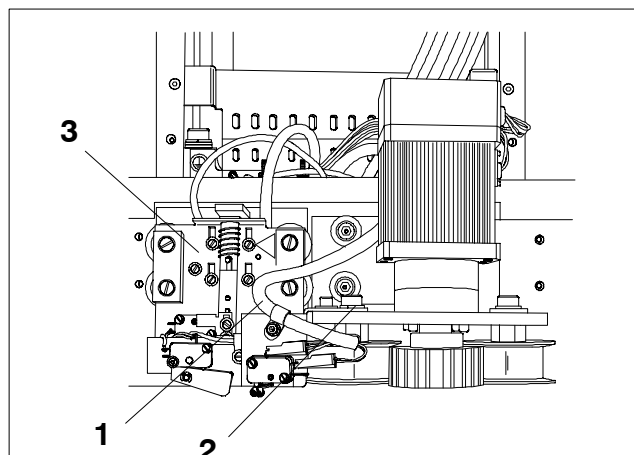


- Remove the tomo tension spring.
- Hook in the new tomo tension spring.
- Tense the spring and fasten the outside end.
- Remove the wire.
- Re-install the cover.

1.8.10. Replacement of the tomo switch unit**Code No. 4512 133 0415.**

 1 h	Replacement of the tomo switch unit	
---	-------------------------------------	--

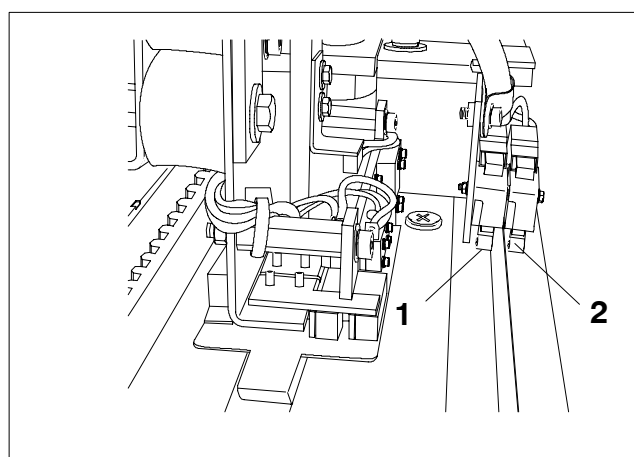
- Remove column base rear cover (7).
- Remove the cable (1) from the switch unit.
- Loosen the two screws (2).
- Replace the tomo switch unit (3).

**Note**


The switches (1, 2) can be damaged by the switch plates if the switches are installed too low.

The switches are adjusted correctly if the respective switching cam touches only the respective switch.

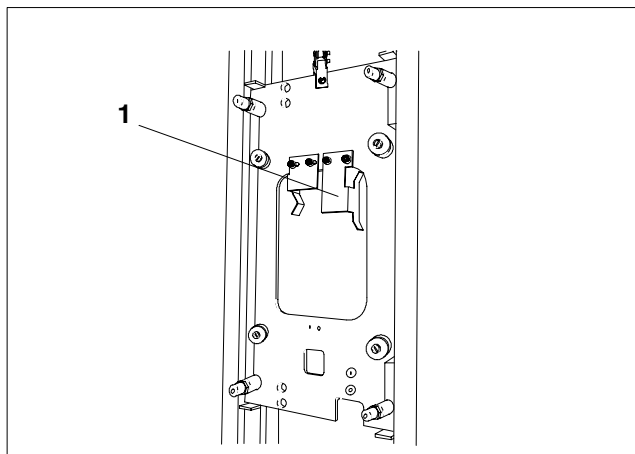
- Connect the cable.
- Check for correct switch position while moving the system over the whole range.
- Check the functions of the system.
- Re-install the cover.



1.8.11. Replacement of the tomo vertical cam**Code No. 4512 133 0322.**

 4 h	Replacement of the tomo vertical cam	
---	---	--

- Remove the front covers (1, 2).
- Remove the tube carrier arm according to chapter 1.1.6.
- Replace the tomo vertical cam (1).
- Re-attach the tube arm according to chapter 1.6.1.
- Do all necessary adjustment procedures.
- Check the function of the system.
- Re-install the covers.




2. FS Compact

2.1. Carriage

2.2. Column

2.2.1. Replacement of the chain


Code No. 4512 133 0340.

 4 h	Replacement of the chain	
---	--------------------------	--

- Replace the chain according to chapter 1.3.1.

2.2.2. Replacement of the magnetic brake UACX1


Code No. 4512 131 8748.

 1 h	Replacement of the magnetic brake UACX1	
---	--	--

- Replace the magnetic brake UACX1 according to chapter 1.3.2.

2.2.3. Replacement of the vertical carriage


Code No. 4512 133 0321.

 4 h	Replacement of the vertical carriage	
---	---	--

- Replace the vertical carriage according to chapter 1.3.3.


2.2.4. Replacement of the castor vertical carriage

Code No. 4512 133 0492.

 1 h	Replacement of the castor vertical carriage	
---	--	--


- Replace the castor vertical carriage according to chapter 1.3.4.

2.2.5. Replacement of the sprocket wheel carrier**Code No. 4512 133 0327.**

 2 h	Replacement of the sprocket wheel carrier	
---	--	--

- Replace the sprocket wheel according to chapter 1.3.5.

2.2.6. Replacement of the switch plate**Code No. 4512 133 0323.**

 4 h	Replacement of the switch plate	
---	------------------------------------	--

- Replace the switch plate according to chapter 1.3.6.


2.3. Control grip

2.3.1. Replacement of the PCB control handle CU2

Code No. 4512 108 0718.


Note

After replacement of the CU2 proceed with the height adjustment. Refer to chapter 10.2 'Adjustment of the ceiling suspension height' in manual X-Scope.

 1 h	Replacement of the PCB on the control handle	
--	---	--

2.4. L-shaped tube carrier arm


2.4.1. Replacement of the complete tube carrier arm

 4 h	Replacement of the complete L-shaped tube carrier arm	
---	---	--

Refer to chapter 1.7.1 Replacement of the complete tube carrier arm, extendable with option tomo.

2.4.2. Replacement of the base plate installed micro switch


Code No. 4512 133 0593.

 0.5 h	Replacement of the base plate installed micro switch	
---	--	--

- Replace the base plate installed micro switch according to chapter 1.4.2.

2.4.3. Replacement of the catch


Code No. 4512 133 0452.

 0.5 h	Replacement of the catch	
---	--------------------------	--

- Replace the catch according to chapter 1.4.3.

2.4.4. Replacement of the magnetic unit


Code No. 4512 133 0584.

 0.5 h	Replacement of the magnetic unit	
---	----------------------------------	--

- Replace the magnetic unit according to chapter 1.4.4.

2.4.5. Replacement of the alpha switch plate

Code No. 4512 133 1441.

 1 h	Replacement of the alpha switch plate	
---	---------------------------------------	--


- Replace the alpha switch plate according to chapter 1.4.5.

3. FS Fix

3.1. Column

3.1.1. Replacement of the chain


Code No. 4512 133 0340.

 4 h	Replacement of the chain	
---	--------------------------	--

- Replace the chain according to chapter 1.3.1.

3.1.2. Replacement of the magnetic brake UACX1


Code No. 4512 131 8748.

 1 h	Replacement of the magnetic brake UACX1	
---	--	--

- Replace the magnetic brake UACX1 according to chapter 1.3.2.

3.1.3. Replacement of the vertical carriage


Code No. 4512 133 0321.

 4 h	Replacement of the vertical carriage	
---	---	--

- Replace the vertical carriage according to chapter 1.3.3.

3.1.4. Replacement of the castor vertical carriage


Code No. 4512 133 0492.

 1 h	Replacement of the castor vertical carriage	
---	--	--

- Replace the castor vertical carriage according to chapter 1.3.4.


3.1.5. Replacement of the sprocket wheel carrier

Code No. 4512 133 0327.

 2 h	Replacement of the sprocket wheel carrier	
---	--	--

- Replace the sprocket wheel carrier according to chapter 1.3.5.


3.1.6. Replacement of the switch plate**Code No. 4512 133 0323.**

 4 h	Replacement of the switch plate	
---	------------------------------------	--

- Replace the switch plate according to chapter 1.3.6.


3.2. Control grip**3.2.1. Replacement of the PCB control handle CU2****Code No. 4512 108 0718.****Note**

After replacement of the CU2 proceed with the height adjustment. Refer to chapter 10.2 'Adjustment of the ceiling suspension height' in manual X-Scope.

 1 h	Replacement of the PCB on the control handle	
---	---	--

3.3. Long tube carrier arm


3.3.1. Replacement of the complete tube carrier arm

 4 h	Replacement of the complete tube carrier arm	
---	--	--

Refer to chapter 1.7.1 Replacement of the complete tube carrier arm, extendable with option tomo.

3.3.2. Replacement of the base plate installed micro switch


Code No. 4512 133 0593.

 0.5 h	Replacement of the base plate installed micro switch	
---	--	--

- Replace the base plate installed micro switch according to chapter 1.4.2.

3.3.3. Replacement of the catch


Code No. 4512 133 0452.

 0.5 h	Replacement of the catch	
---	--------------------------	--

- Replace the catch according to chapter 1.4.3.

3.3.4. Replacement of the magnetic unit


Code No. 4512 133 0584.

 0.5 h	Replacement of the magnetic unit	
---	----------------------------------	--

- Replace the magnetic unit according to chapter 1.4.4.

3.3.5. Replacement of the alpha switch plate

Code No. 4512 133 1441.

 1 h	Replacement of the alpha switch plate	
---	---------------------------------------	--

- Replace the alpha switch plate according to chapter 1.4.5.

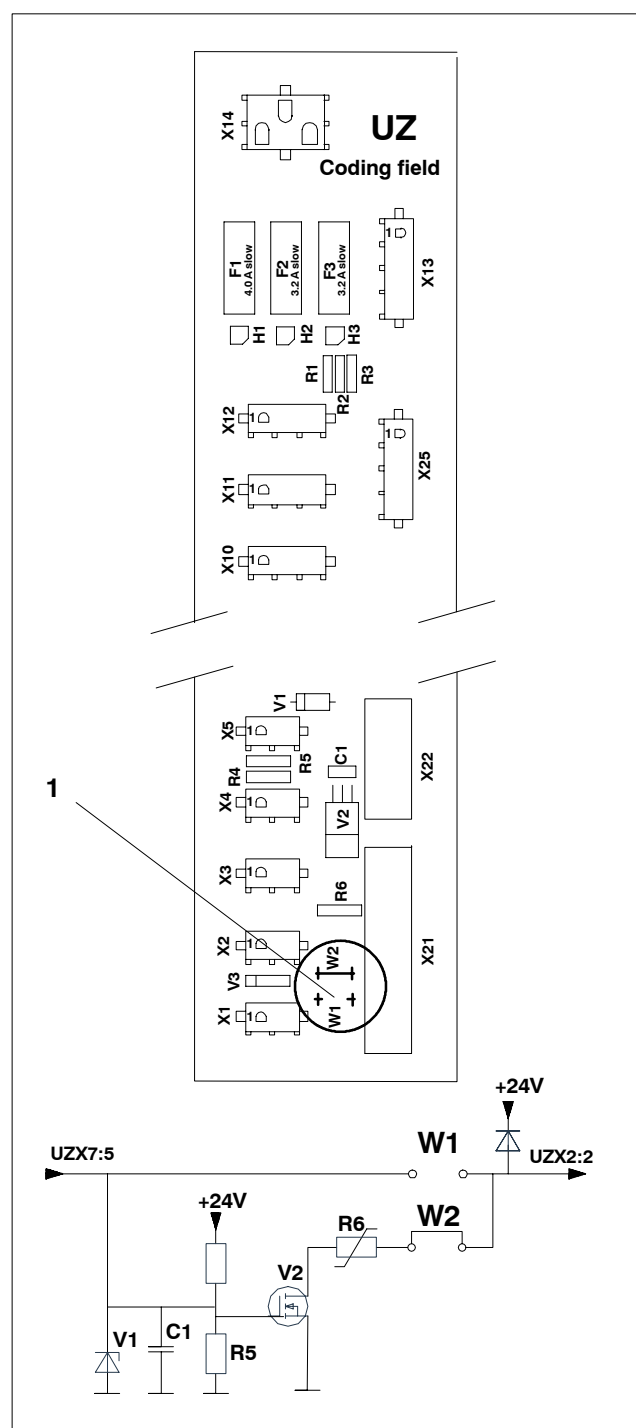


1. Programmings

1.1. Hardware

Programming of the UZ field 4512 108 0738x:

- Open link **W1 (1)**.



1.2. Software programmings with X-Scope

Refer to manual X-Scope in SMI BuckyDiagnost FS.

Adjustments

TEXT

	Contents	6-0.1
1.	Adjustments	6-1
1.1.	Final alignment check of the column	6-1
1.2.	Centering the system	6-1
1.3.	Alignment to the table	6-2
1.4.	Laser alignment	6-2
1.4.1.	Center laser alignment	6-2
1.4.2.	SID laser alignment	6-3
1.4.3.	Final work	6-3

1. Adjustments

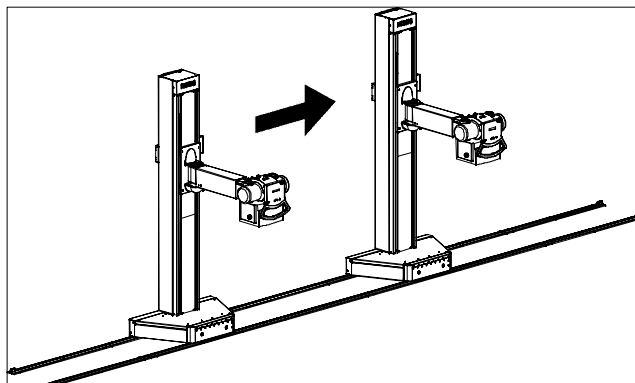
1.1. Final alignment check of the column

Note

All components of the system e.g. table, wallstand, generator have to be installed and ready for operation before aligning the bucky FS.

- Move the column to the left end position.
- Check the alignment of the rails by moving the column smoothly to the other end. The column must remain steadily upright over the whole length. If necessary, adjust the level of the front rail with linings as described in Section 2.4.1.4 "Height adjustment for the first rail".

The alignment can be done either with the spirit level or with the following method:

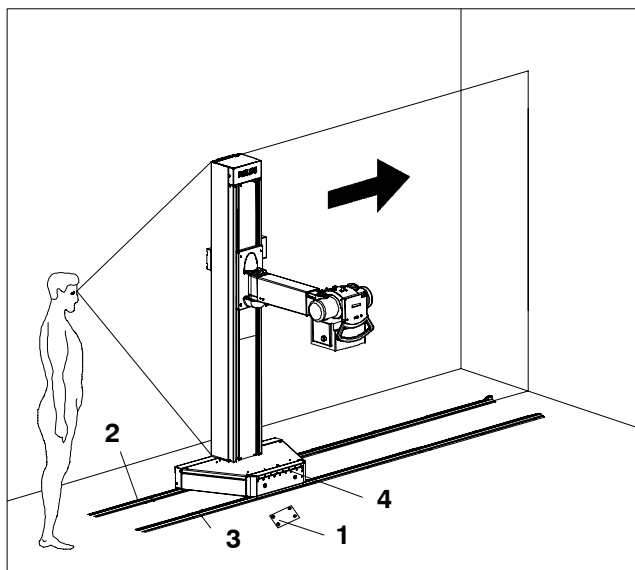


Final adjustment

- Affix a vertical line to the wall on the right-hand side, e.g. with a colored adhesive tape, check the vertical alignment while moving the column along the rail.

If corrections should be necessary:

- Add adjustment plates (1) under back rail (2) or front rail (3) or for vertical correction (4).



1.2. Centering the system

- Switch the system ON.
- Fix the bucky in the **system center position**.
- Switch ON the simulation light.

The cross line of the collimator and the cross line of the grid should coincide. If necessary, position the catch plates.

1.3. Alignment to the table

Note

Check the correct alignment of the table! Refer to Subsystem manual BuckyDiagnost TH2, section Installation, chapter 3.

- Check the alignment of the system.
 - Move the FS to the lowest position.
 - Move the FS to the highest position.

The cross should not vary more than ± 2 mm per meter off the center.

If the cross lays out of the center of the collimator:

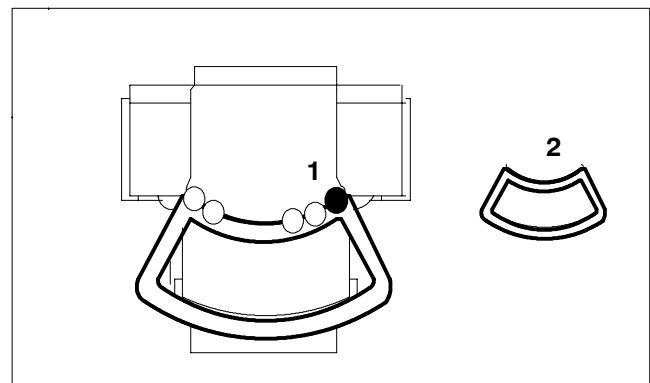
- Align the tube by loosening the screws at the holder or of the tube. Respect the direction of variation.
 - Fasten the screws, then repeat the procedure.
- Remove the mirror.

1.4. Laser alignment

Note

Check the alignment of the laser light with the collimator light field. If the laser light is not centered with respect to the collimator light, proceed as follows:

- Position the control handle at $\alpha = 0^\circ$ position, the LED (1) = **ON**.
- Remove the control handle grip (2) on the rear side by loosening screws and nuts.

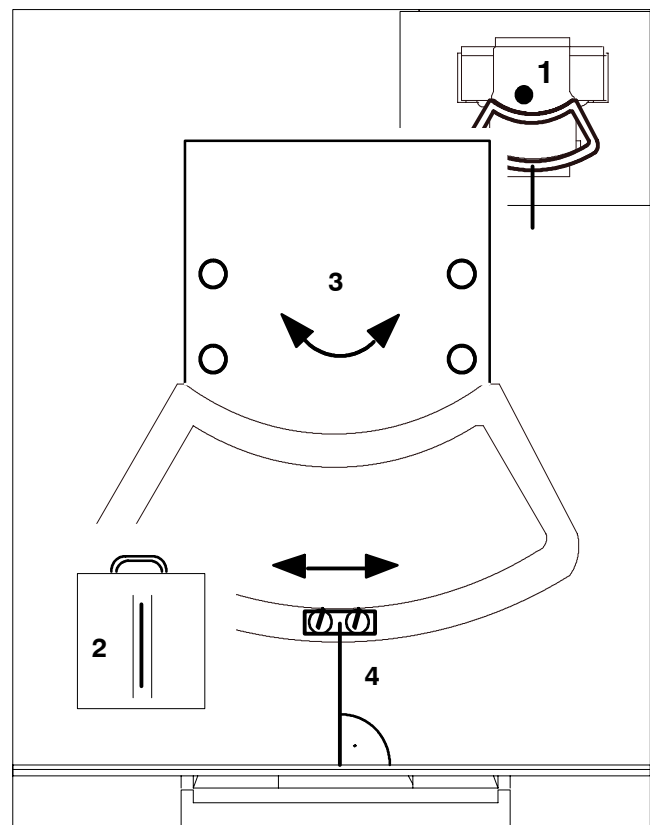


1.4.1. Center laser alignment

- Press button (1).
- The center laser and the diaphragm light are **ON**.
- Move the table top up and down.
- Observe the center laser light on the table top.
 - If the beam wanders (2), rotate the control handle by loosening four screws (3) on the rear side.
- Tighten the screws, then repeat the procedure.

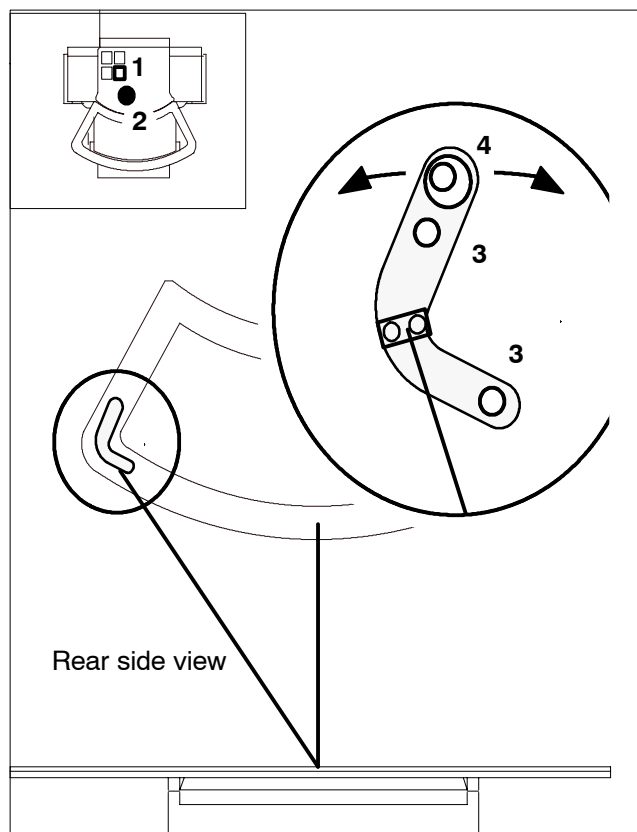
Fine adjustment:

- Loosen the two fixing screws (4) of the center laser.
- Adjust the laser.
- Tighten the two fixing screws (4).



1.4.2. SID laser alignment

- Select the RGDV4 for free exposure (1), see **SID-Selection with Program X-Scope**, function **None** should not be selected!
- Ask the operator for the preferred SID. The default pre-adjustment is SID = 1100 mm.
- Raise the table top to the preferred value of the SID = 900 ... 1200 mm.
- Press button (2) = center laser and pulsing SID laser and diaphragm light are **ON**.
- Observe the center laser and the pulsing SID laser on the table top.
 - If the beams are not merged, loosen the two fixing screws (3) and adjust the SID laser with the eccentric screw (4).
 - Tighten the two fixing screws (3).



1.4.3. Final work

- Install the removed control handle grip on the rear side

Note

Make sure that the laser wires are not damaged during the attachment of the grip. If necessary, fix the wires with adhesive tape.

ACCEPTANCE

Contents

TEXT

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1.	Collimator compliance test	7-3
1.1.	Introduction	7-3
1.2.	Test 1: Alignment of collimator light field and X-ray field (radiographic)	7-5
1.3.	Test 2: X-ray field center alignment (overtable tube)	7-6
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1. COLLIMATOR COMPLIANCE TEST

1.1. INTRODUCTION



NOTE

This test must be performed after each exchange of collimator or X-ray source to be in compliance with IEC 60601-1-3 and 21CFR 1020. This test is mandatory for the USA and Canada. If measurements show values beyond acceptable tolerances, check the mechanical adjustments and repeat measurements. If the stated tolerances are exceeded, the system is not in compliance with IEC 60601-1-3 and FDA regulations and must not be operated.

Test equipment / tools

- Cassette (18x 24 cm)
- Cassette (24 x 30 cm)
- Cassette (35 x 43 cm)
- Cassette (35 x 35 cm)
- Ruler, metric / inch
- Metal washer
- 10 foot measuring tape
- 4 copper strips

1.2. TEST 1: ALIGNMENT OF COLLIMATOR LIGHT FIELD AND X-RAY FIELD (RADIOGRAPHIC)



NOTE

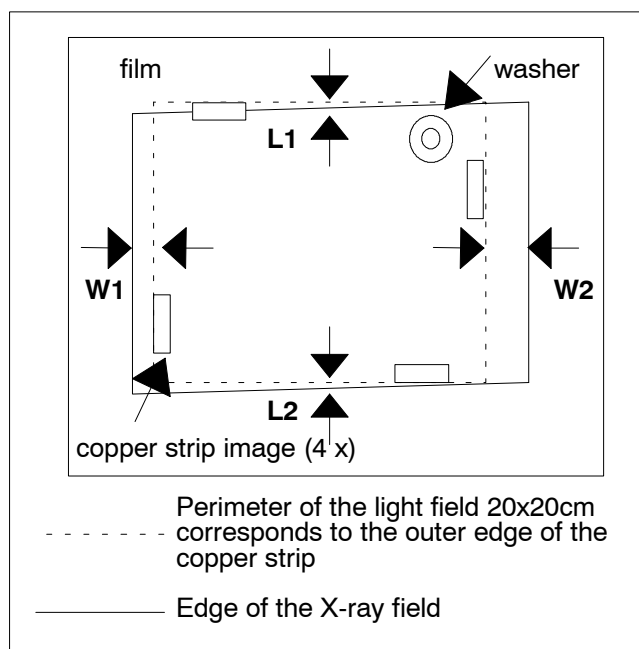
This test is to determine that the X-ray field size and location is identical to the collimator light field for large and small focus!

Setup

1. Place the loaded 10 x 12" (24 x 30 cm) cassette on the table top and center the overtable tube directly at an SID of 40" (100 cm).
2. Place an empty 8 x 10" (18 x 24 cm) cassette in the bucky unit to enable exposure.

Test

1. Turn on the collimator light.
2. Define the light field perimeter by placing the outer edges of the copper strips at the four light field sides (refer to figure).
3. Place the washer in one quadrant of the film at the anode end to identify the positioning after development of the film.
4. Select the large focus and overtable tube at the control desk and expose at 60 kV, 5 mAs.
5. Develop the film.
6. Measure the distances L1, L2, W1 and W2 between the outside edges of the copper strips and the edges of the X-ray field as shown.
7. Repeat the test for the small focus.



Result

Record all measurements in the table below. The measurements must comply with the specification limits.
Write the test number and date on the film and file it with this document.

Specification

The total misalignment of the edges of the collimator light field with the respective edges of the X-ray field along either the width or length of the light field shall not exceed 2 % of the SID.

SID = 40" (100 cm); 2.0 % x 40" (100 cm) = 0.80" (2 cm)	
Large focus	$L1 + L2 = \underline{\hspace{1cm}} + \underline{\hspace{1cm}} = \leq 2.0 \% \text{ SID}$ $W1 + W2 = \underline{\hspace{1cm}} + \underline{\hspace{1cm}} = \leq 2.0 \% \text{ SID}$
Small focus	$L1 + L2 = \underline{\hspace{1cm}} + \underline{\hspace{1cm}} = \leq 2.0 \% \text{ SID}$ $W1 + W2 = \underline{\hspace{1cm}} + \underline{\hspace{1cm}} = \leq 2.0 \% \text{ SID}$

Initials	Date

1.3. TEST 2: X-RAY FIELD CENTER ALIGNMENT (OVERTABLE TUBE)

**NOTE**

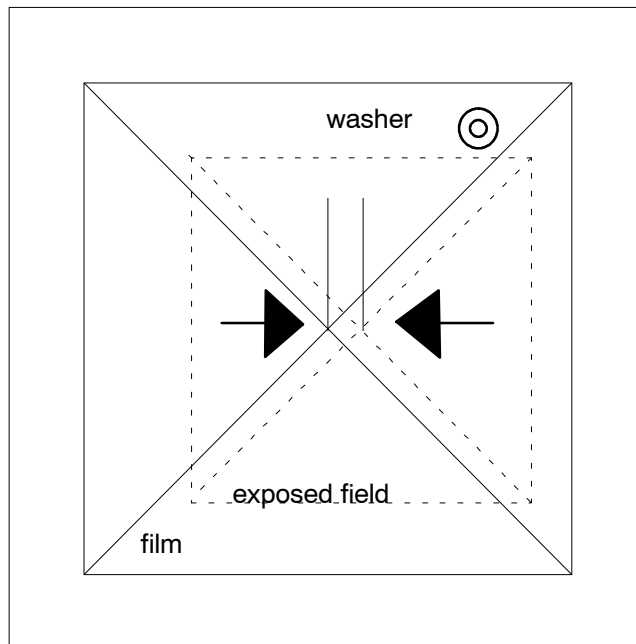
This test must be performed for all tables / bucky stations as well as bucky wallstands, cassette stands etc.!

Setup

Equipment completely assembled.

Test

1. Select the tube and image receptor station on the control desk.
2. Center the tube with respect to the image receptor by using the available centering aids (the centering stops on the ceiling rails, the centering light in the tube control handle bar etc.). Set the tube at max. SID: 40" (100 cm) for bucky table, up to 72" (180 cm) for bucky wallstand.
3. Tape the metal washer in one quadrant of the cassette at the anode end for film orientation.
4. Place the loaded cassette (10 x 12 ") or (24 x 30 cm) in the bucky tray and ensure that it is properly centered before the tray is inserted in the bucky unit.
5. Manually set the collimator to a slightly smaller size (about 9 x 11") than the cassette size so that the radiated area is within the limits of the X-ray film.
6. Make an exposure at 60 kV, 5 mAs.
7. Develop the film.
8. On the developed film, locate two points on each of the four sides of the exposed field as it is shown in the figure.
9. Draw straight lines through two points on each side. Extend the lines until they intersect. The resulting rectangle is a close approximation of the X-ray field.
10. Draw diagonals across this field. The crossing point of the diagonals is the X-ray field center. Also draw diagonals across the X-ray film. The crossing point is the X-ray film center.
11. Measure the distance between both centers.



Results

Record the displacement in the table below. Write the test number and date on the film and file it with this document. The test result must be within the specification limits.

Specification

The displacement between the X-ray film center and the X-ray field center must be $\leq 2.0\%$ SID.

SID = 100 cm; maximum displacement = 20 mm

SID = 180 cm; maximum displacement = 36 mm.



NOTE

This test must be performed for all tables / bucky stations as well as bucky wallstands, cassette stands etc.!
If a tube can be used at two different SIDs with the same image receptor, test for both SIDs (tracking).

Measured displacement (mm) Maximum displacement for SID = 100 cm = 20 mm Maximum displacement for SID = 180 cm = 36 mm	
bucky table	bucky wallstand
_____ mm	_____ mm
_____ mm	_____ mm

Initials	Date

1.4. TEST 3: X-RAY FIELD LIMITATION AND PBL OPERATION RANGE**NOTE**

This test must be performed for all overtable tube / bucky stations as well as bucky wallstands, cassette stands etc.! Stands that are used at two different SIDs must be tested at both distances.

Setup

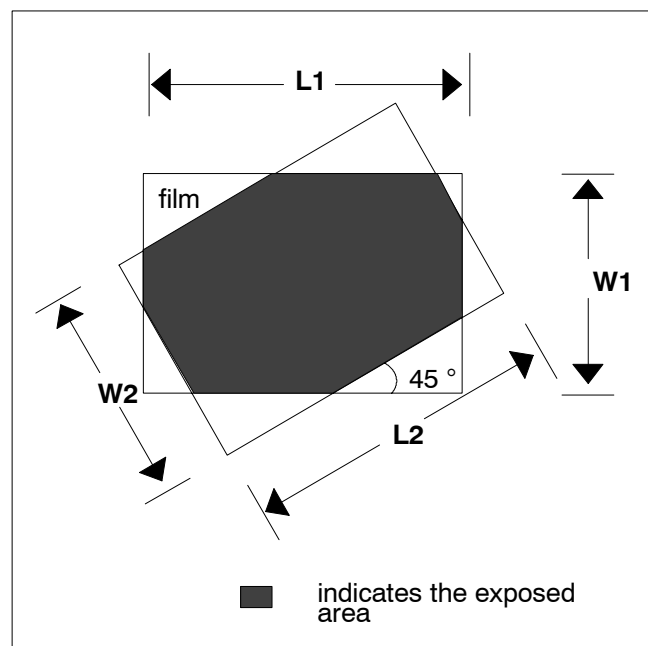
Equipment completely assembled.

Test**TABLE BUCKY (Field Limitation Test / Indicated Field Test)**

1. Select table bucky auxiliary at the generator control desk.
2. Set SID to 100 cm. Center the X-ray tube over table bucky.
3. Rotate the collimator to 45°.
4. Insert the loaded 18 x 24 cm cassette in the bucky tray.
5. Record the indicated field size from collimator dials below.

Length = _____ Width = _____

6. Make an exposure at 60 kV, 5 mAs.
7. Remove the cassette and put it to a radiation-safe place.
8. Repeat steps 4 and 6 using a loaded 35 x 43 cm cassette.
9. Develop both films.
10. Referring to the figure, measure the actual length and width of both films (L1 and W1). Measure the length and width of the exposed area of both films (L2 and W2).

**Results**

Record all measurements in the table below. Verify that the results are within the specifications. Write the test number and date on the films and file them with this document.

Test

BUCKY WALLSTAND (Field Limitation Test)

1. Select bucky wallstand at the generator control desk.
2. Center the X-ray tube with respect to the bucky wallstand and set the SID to 180 cm (72").
3. Rotate the collimator to 45°.
4. Insert the loaded 18 x 24 cm cassette in the bucky tray.
5. Make an exposure at 60 kV, 5 mAs.
6. Remove the cassette and put it to a radiation-safe place.
7. Repeat steps 4 and 6 using a loaded 35 x 43 cm cassette.
8. Develop both films.
9. Referring to the figure on the next page, measure the actual length and width of both films (L1 and W1). Measure the length and width of the exposed area of both films (L2 and W2).

Results

Record all measurements in the table below. Verify that the results are within the specifications. Write the test number and date on the films and file them with this document.

Specifications

1. The total misalignment of the edges of the X-ray field with the respective edges of the selected portion of the image receptor along the length or width dimensions of the X-ray field in the plane of the image receptor shall not exceed 3 % of the SID.
2. The sum, without regard to the sign, of the above length and width misalignments shall not exceed 4 % of the SID.
3. The indicated field size and actual field size must be within 2 % of the maximum SID.
4. For BLDs with PBL and manufactured after November 30, 1983:
Positive Beam Limiting must be operational when:
 - a X-ray beam is within ± 3 % of vertical and
. SID is 90 cm to 130 cm, inclusive.
 - b X-ray beam is within ± 3 % of horizontal and
. SID is 90 cm to 205 cm, inclusive.



NOTE

This test must be performed for all overtable tube / bucky stations as well as bucky wallstands, cassette stands etc.! Stands that are used at two different SIDs must be tested at both distances.

BUCKY TABLE:

Indicated field size (Value read off of the collimator)		
	18 x 24 cm cassette	35 x 43 cm cassette
Indicated Width		
Indicated Length		

18 x 24 cm cassette bucky table			
Film (Actual Length and Width)	Exposed	Difference	Specification 100 cm SID
L1 = _____ cm	L2 = _____ cm	L1 - L2 = _____ cm	≤ 3 cm
W1 = _____ cm	W2 = _____ cm	W1 - W2 = _____ cm	≤ 3 cm
		Total difference = (sum of above) _____ cm	≤ 4 cm

Indicated	Exposed	Difference	Specification 100 cm SID
(L step 5) _____ cm	(L2 above) _____ cm	(Ind - Exp) _____ cm	≤ 2 cm
(W step 5) _____ cm	(W2 above) _____ cm	(Ind - Exp) _____ cm	≤ 2 cm

BUCKY TABLE (continued):

35 x 43 cm cassette bucky table			
Film (Actual Length and Width)	Exposed	Difference	Specification 100 cm SID
L1 = _____ cm	L2 = _____ cm	L1 - L2 = _____ cm	≤ 3 cm
W1 = _____ cm	W2 = _____ cm	W1 - W2 = _____ cm	≤ 3 cm
		Total difference = (sum of above) _____ cm	≤ 4 cm

Indicated	Exposed	Difference	Specification 100 cm SID
(L step 5) _____ cm	(L2 above) _____ cm	(Ind - Exp) _____ cm	≤ 2 cm
(W step 5) _____ cm	(W2 above) _____ cm	(Ind - Exp) _____ cm	≤ 2 cm

Initials	Date

Verify with a check (X) (not for manual collimator)	
X-ray beam direction within 3 % of vertical	
PBL operational from 90...130 cm SID	

Initials	Date

BUCKY WALLSTAND (BWS):

18 x 35 cm cassette bucky wallstand			
Film (Actual Length and Width)	Exposed	Difference	Specification 100 cm SID
L1 = _____ cm	L2 = _____ cm	L1 - L2 = _____ cm	≤ 5.4cm
W1 = _____ cm	W2 = _____ cm	W1 - W2 = _____ cm	≤ 5.4 cm
		Total difference = (sum of above) _____ cm	≤ 7.2 cm

35 x 43 cm cassette bucky wallstand			
Film (Actual Length and Width)	Exposed	Difference	Specification 100 cm SID
L1 = _____ cm	L2 = _____ cm	L1 - L2 = _____ cm	≤ 5.4cm
W1 = _____ cm	W2 = _____ cm	W1 - W2 = _____ cm	≤ 5.4 cm
		Total difference = (sum of above) _____ cm	≤ 7.2 cm

Initials	Date

Verify with a check (X) (not for manual collimator)	
X-ray beam direction within 3 % of vertical	
PBL operational from 90...205 cm SID	

Initials	Date

1.5. COLLIMATOR DATA**General**

Customer:

Customers address:

Equipment address:

Distributor:

Installation date:

Report date:

Name of service engineer:

Signature of the service engineer:

Equipment

Component	Description	Type Number	Serial Number
Collimator	<input type="checkbox"/> GALILEO	9896 010 0061_	
	<input type="checkbox"/> NICOL	9896 010 2200_	
	<input type="checkbox"/> Manual collimator	9890 010 804_ _	
Bucky table			
Bucky wallstand			

Drawings

FS Standard mechanic

BuckyDiagnost FS Standard mechanical dimensions	Z-1.1
BuckyDiagnost FS Standard with tomo and telescope arm mechanical dimensions	Z-1.2
BuckyDiagnost FS Standard floor rails mechanical dimensions	Z-1.3
BuckyDiagnost FS Standard floor rails standard version attachment sketch	Z-2.1
BuckyDiagnost FS Standard floor rails tomo version attachment sketch	Z-2.2

FS Compact mechanic

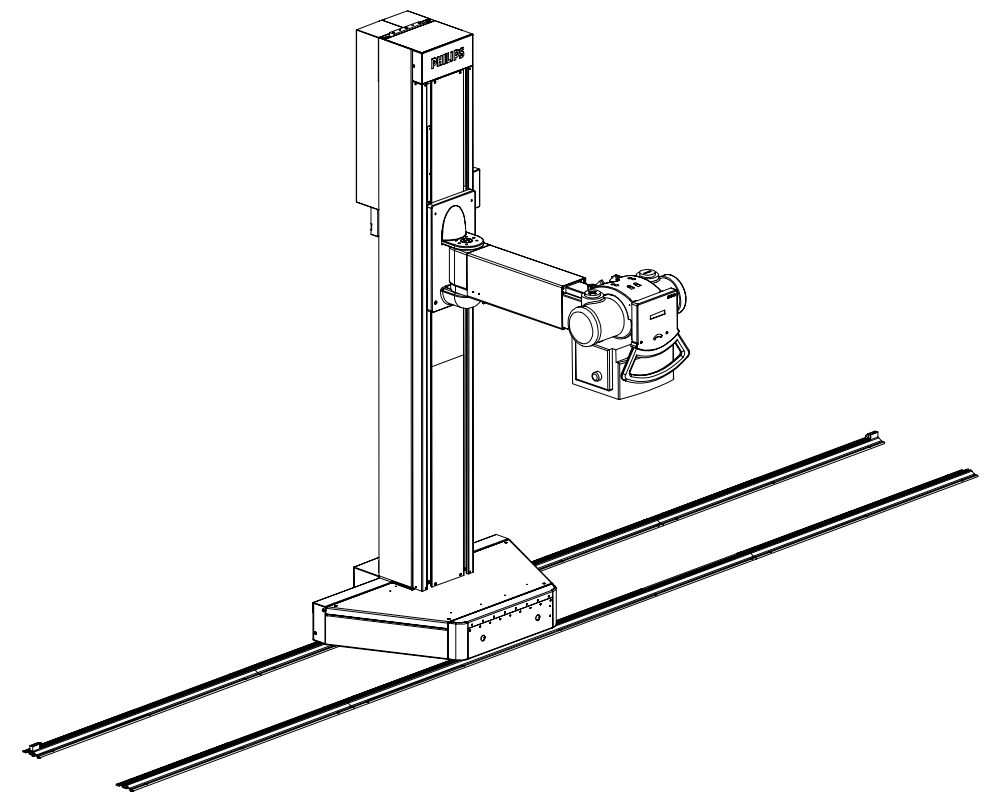
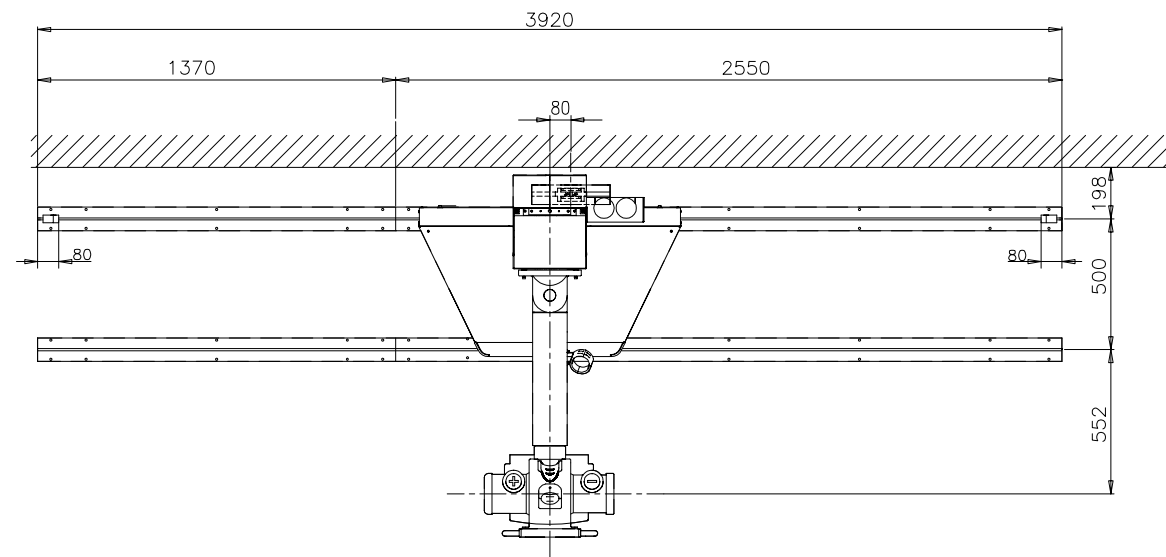
BuckyDiagnost FS Compact version with wall holders standard version mech. dimensions	Z-1.1.1
BuckyDiagnost FS Compact version for ceiling height 2490 to 2804mm mech. dimensions	Z-1.1.2
BuckyDiagnost FS Compact version for ceiling height 2798 to 3400mm mech. dimensions	Z-1.1.3
BuckyDiagnost FS Compact floor rail attachment sketch	Z-2.1
BuckyDiagnost FS Compact ceiling / wall holders mechanical dimensions	Z-1.4
BuckyDiagnost FS Compact wall holder wall fixing	Z-1.5
BuckyDiagnost FS Compact detail attachment	Z-2.2

FS Fix mechanic

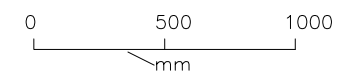
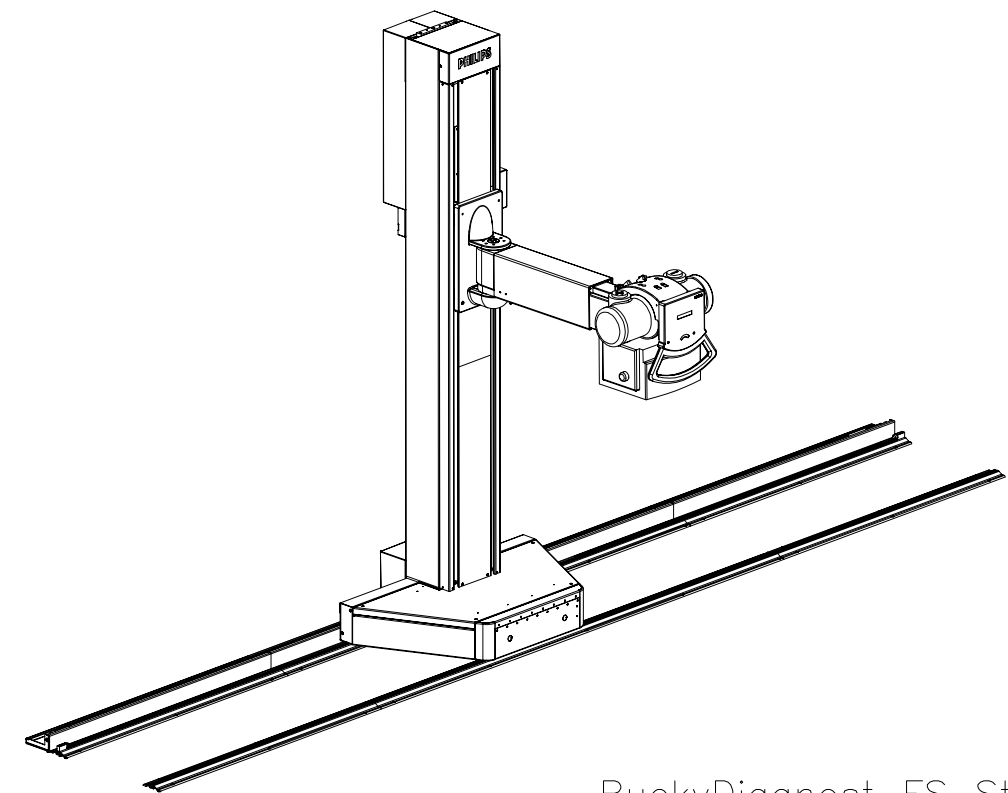
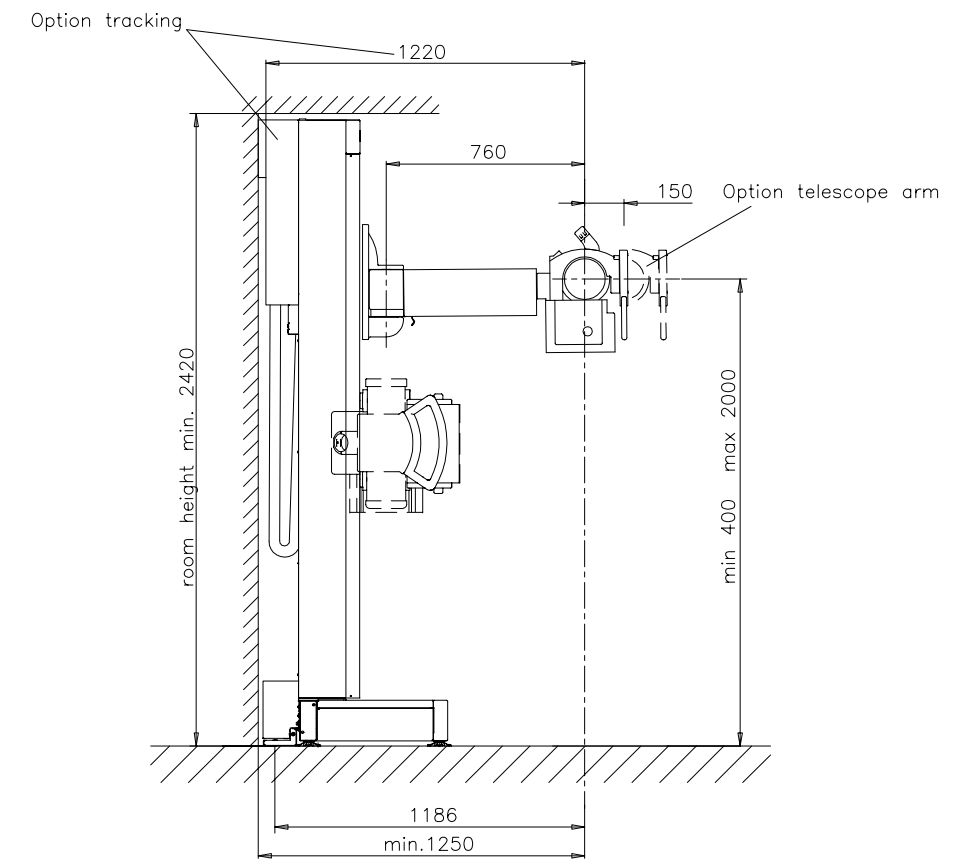
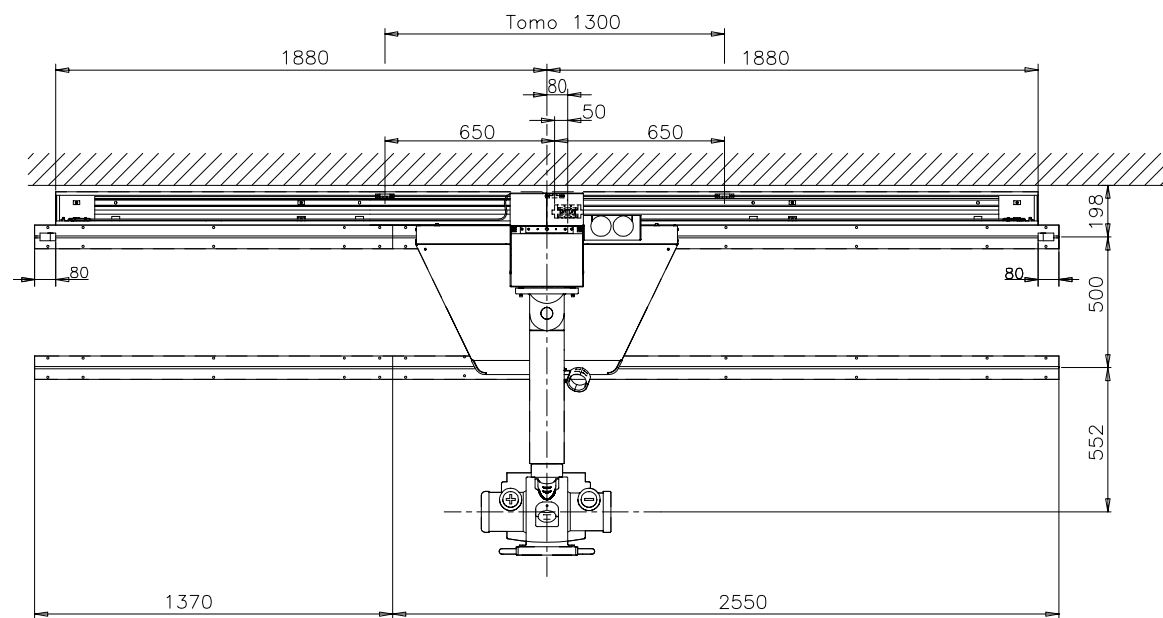
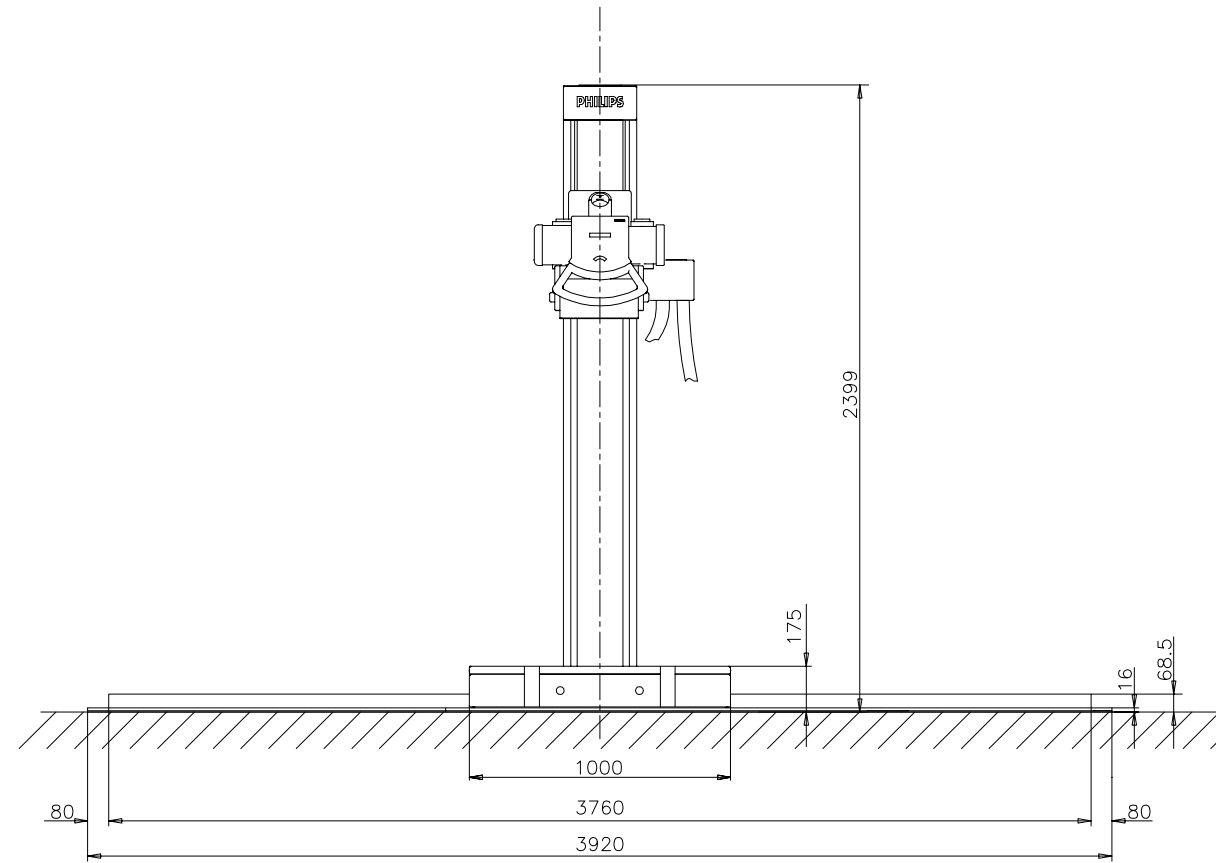
BuckyDiagnost FS Fix with short or long arm mechanical dimensions	Z-1
BuckyDiagnost FS Fix column template	Z-4

FS Standard / Compact / Fix

Cable outlet	Z-1.7
Labelling	2Z-10

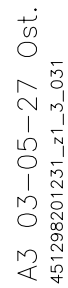


A horizontal number line with tick marks at 0, 500, and 1000. The unit is labeled 'mm'.



BuckyDiagnost FS Standard
with tomo and telescope arm
Mechanical dimensions

Product Planning Data

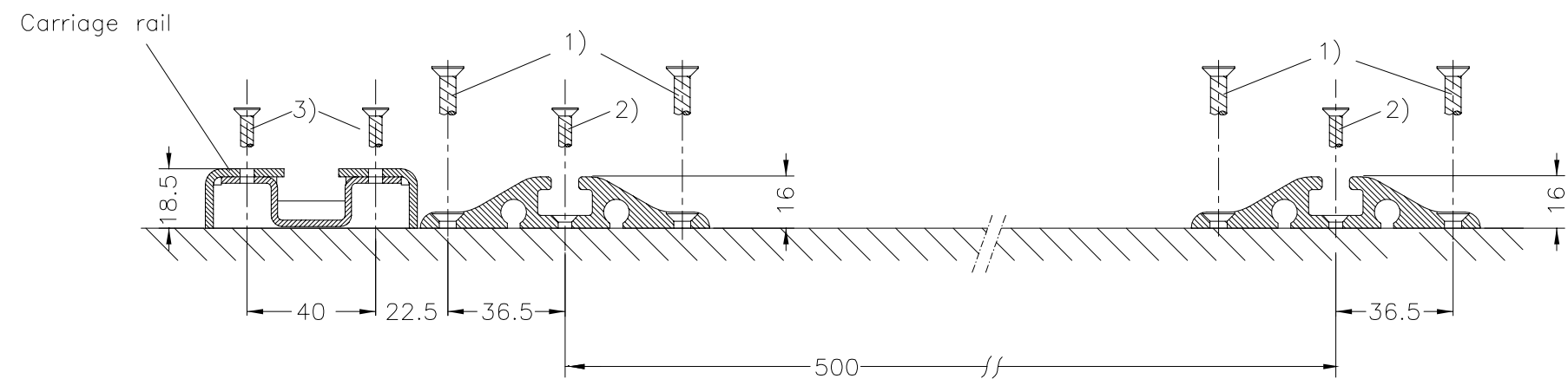


A horizontal number line with tick marks at 0, 250, and 500. The unit 'mm' is written below the tick mark at 250.

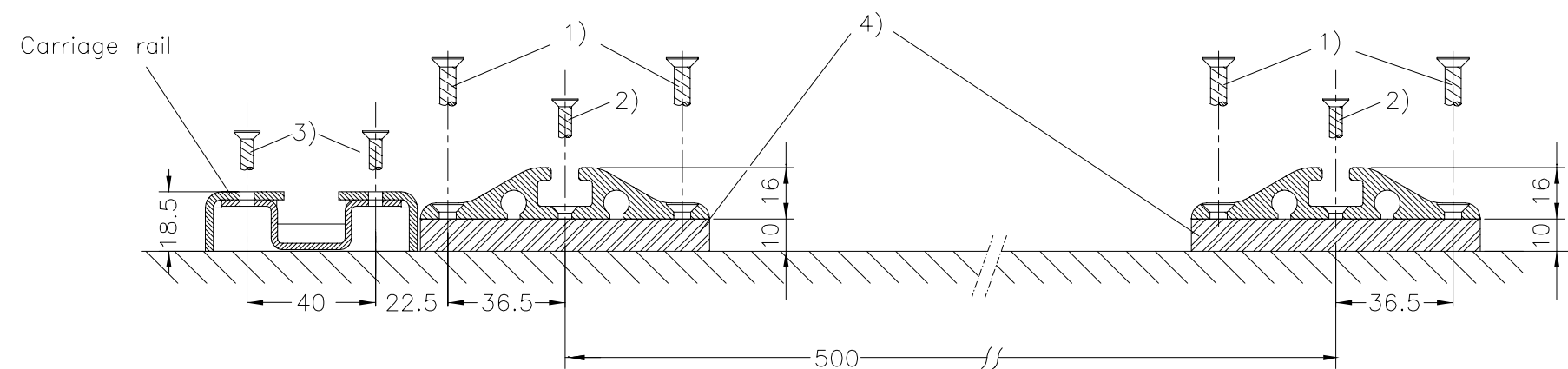
4512 982 0123.
© Philips Medical Systems

Z1-3

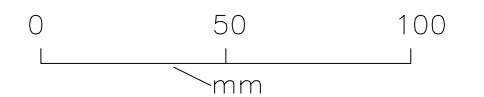
Floor rail without support bar



Floor rail with support bar (optional)

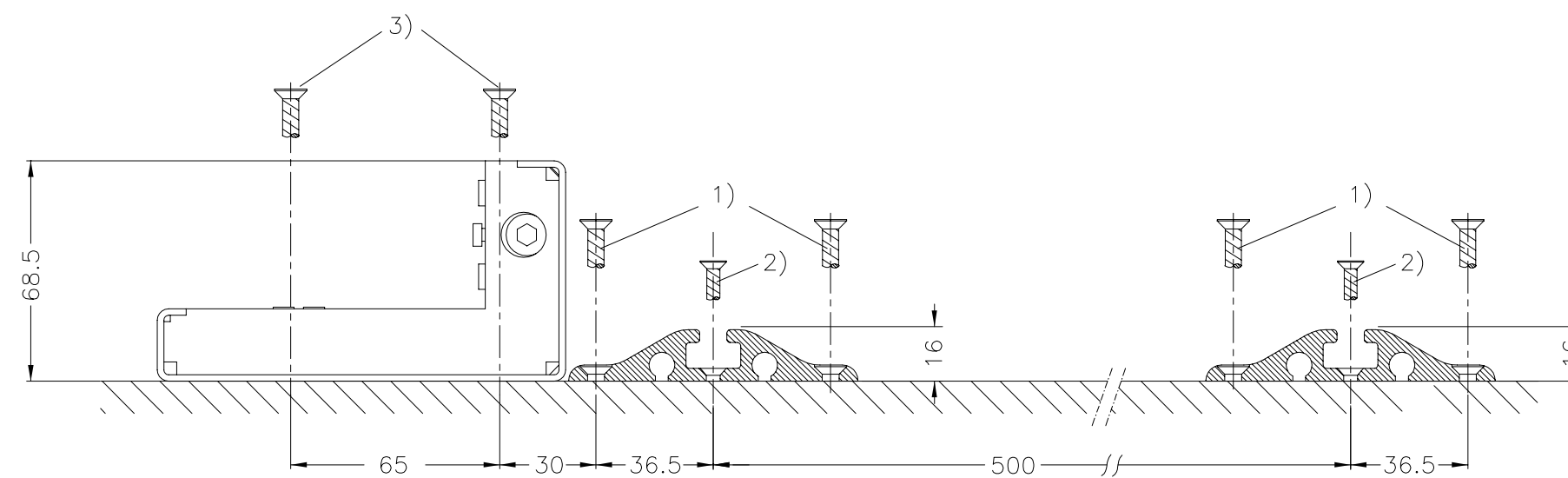


- 1) Phillips screw 5x60 + 8 mm dowels for concrete floors
- 2) Phillips screw 4x50 + 6 mm dowels (optional used for uneven floors)
- 3) Phillips screw 4x50 + 8 mm dowels for concrete floors
- 4) Support bar optional (used for uneven floors)

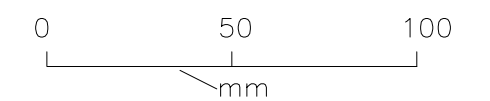
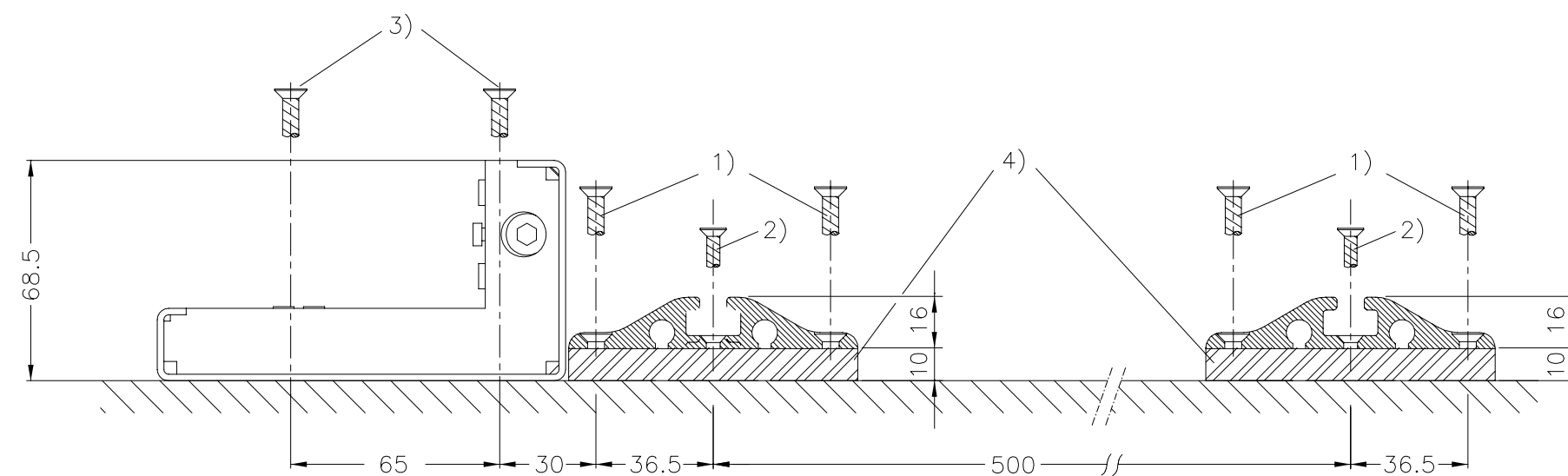


BuckyDiagnost FS Standard
Floor rails
Standard version
Attachment sketch

Floor rails without support bar

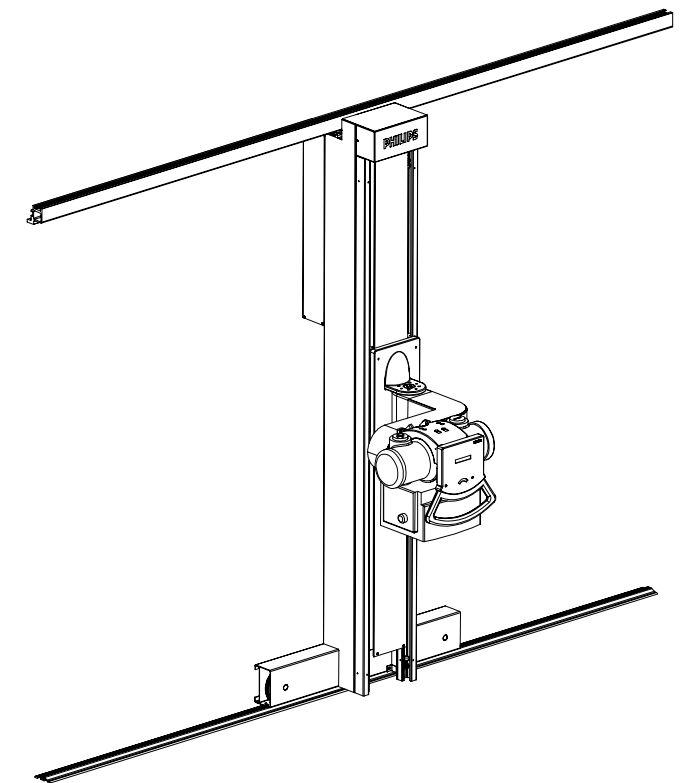
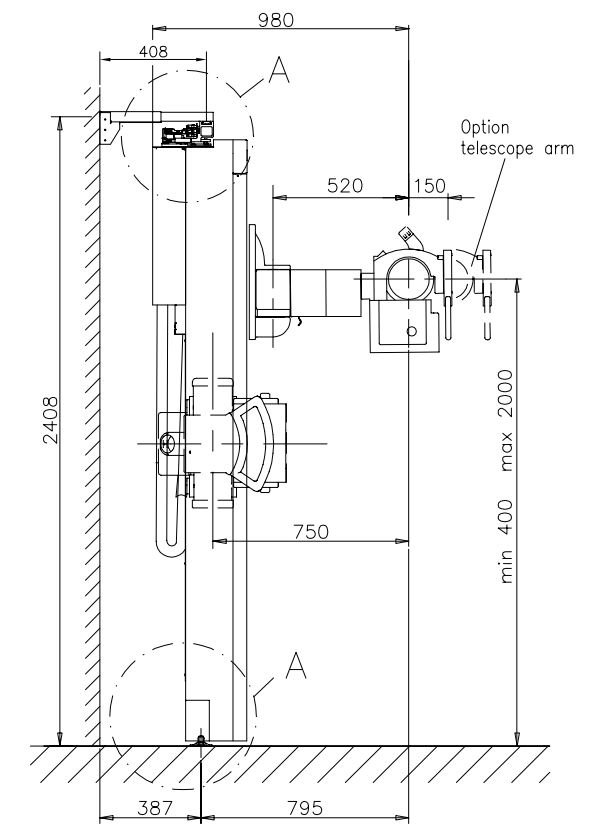
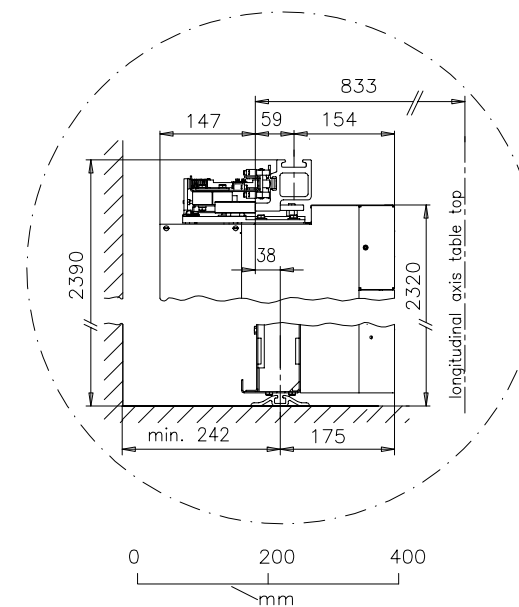
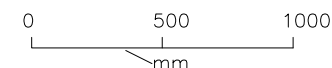


Floor rails with support bar

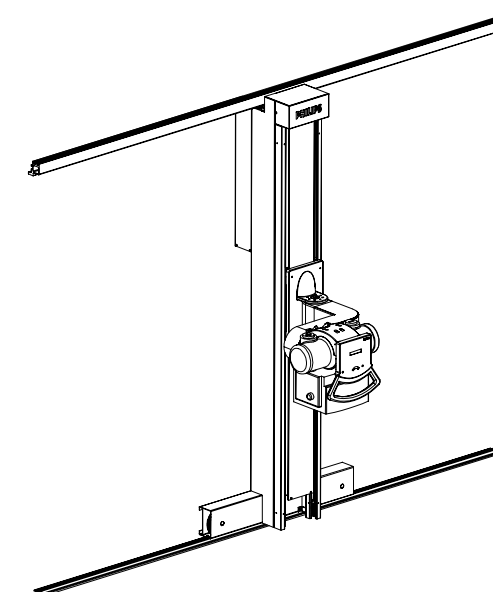
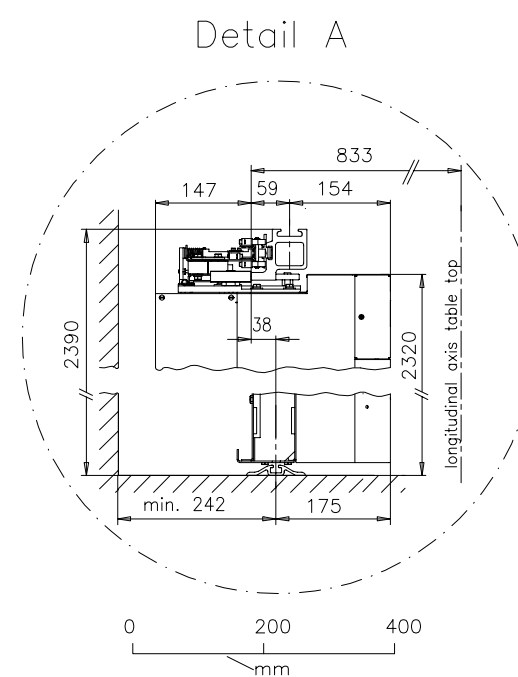
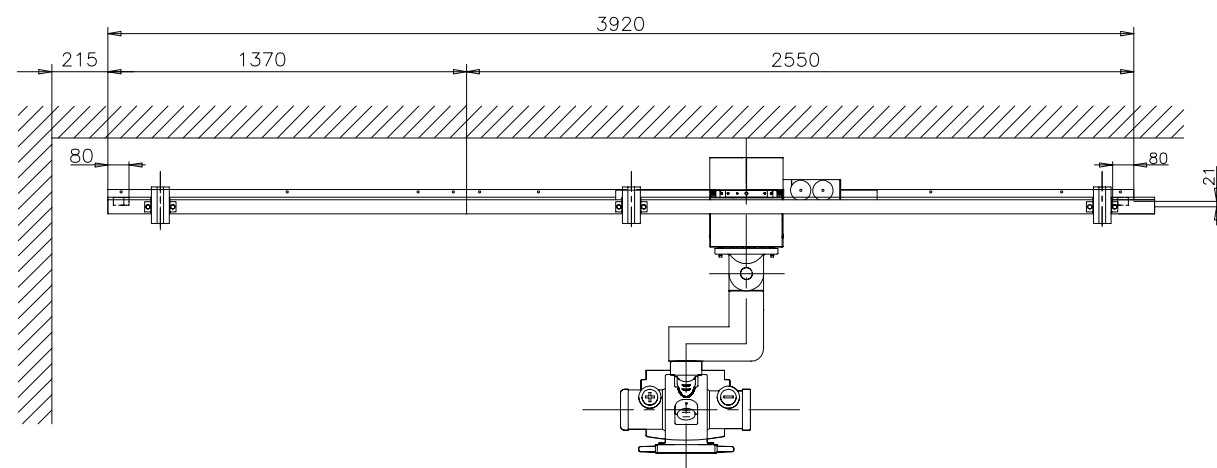


- 1) Phillips screw 5x60 + 8 mm dowels for concrete floors
- 2) Phillips screw 4x50 + 6 mm dowels (optional used for uneven floors)
- 3) Phillips screw 4x50 + 8 mm dowels for concrete floors
- 4) Support bar (used if no foundation frame is installed)

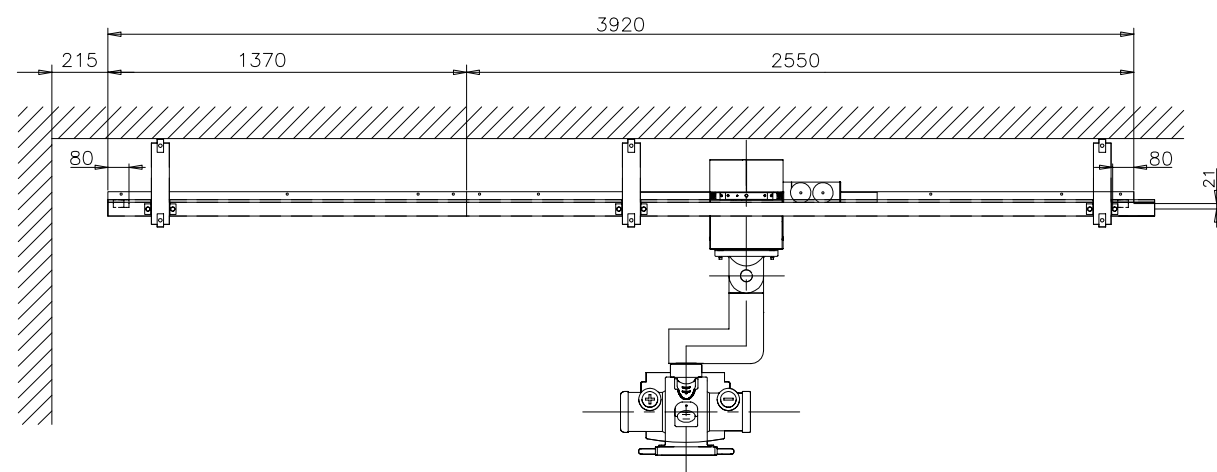
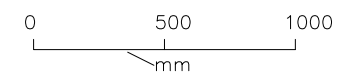
BuckyDiagnost FS Standard
Floor rails
Tomo version
Attachment sketch



BuckyDiagnost FS Compact
Version with wall holders
standard version
Mechanical dimensions



Z-1.1.2



ceiling height 2798...3400

980

A

520

150

Option telescope arm

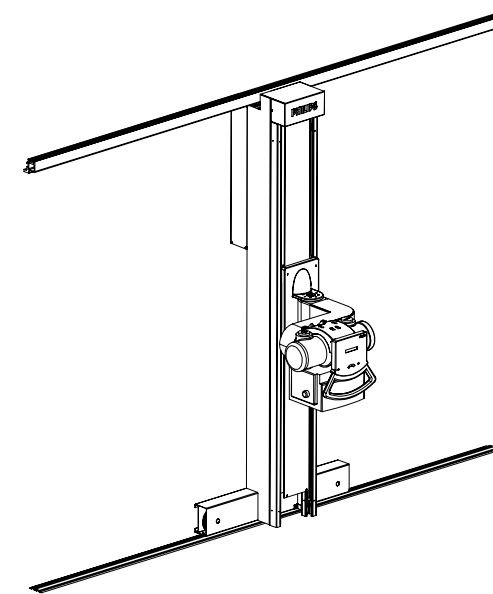
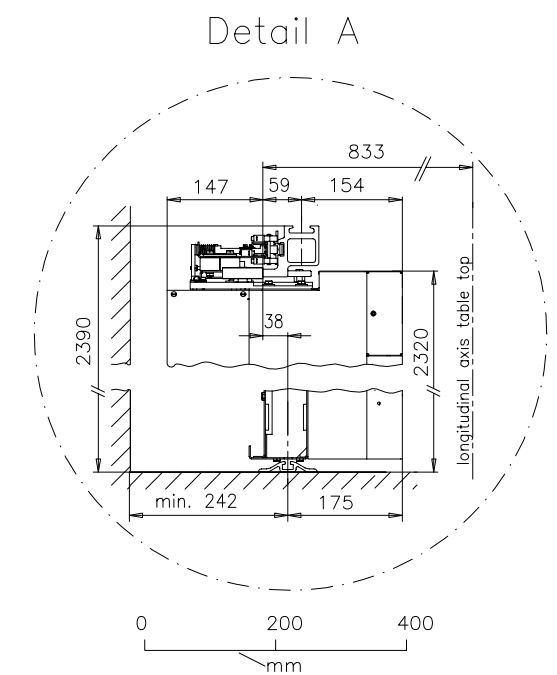
b

750

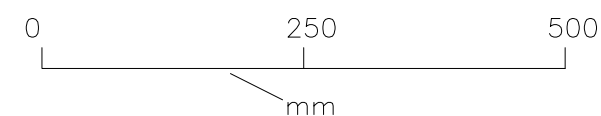
min 400 max 2000

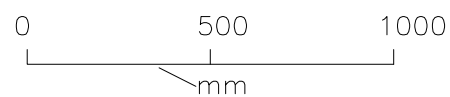
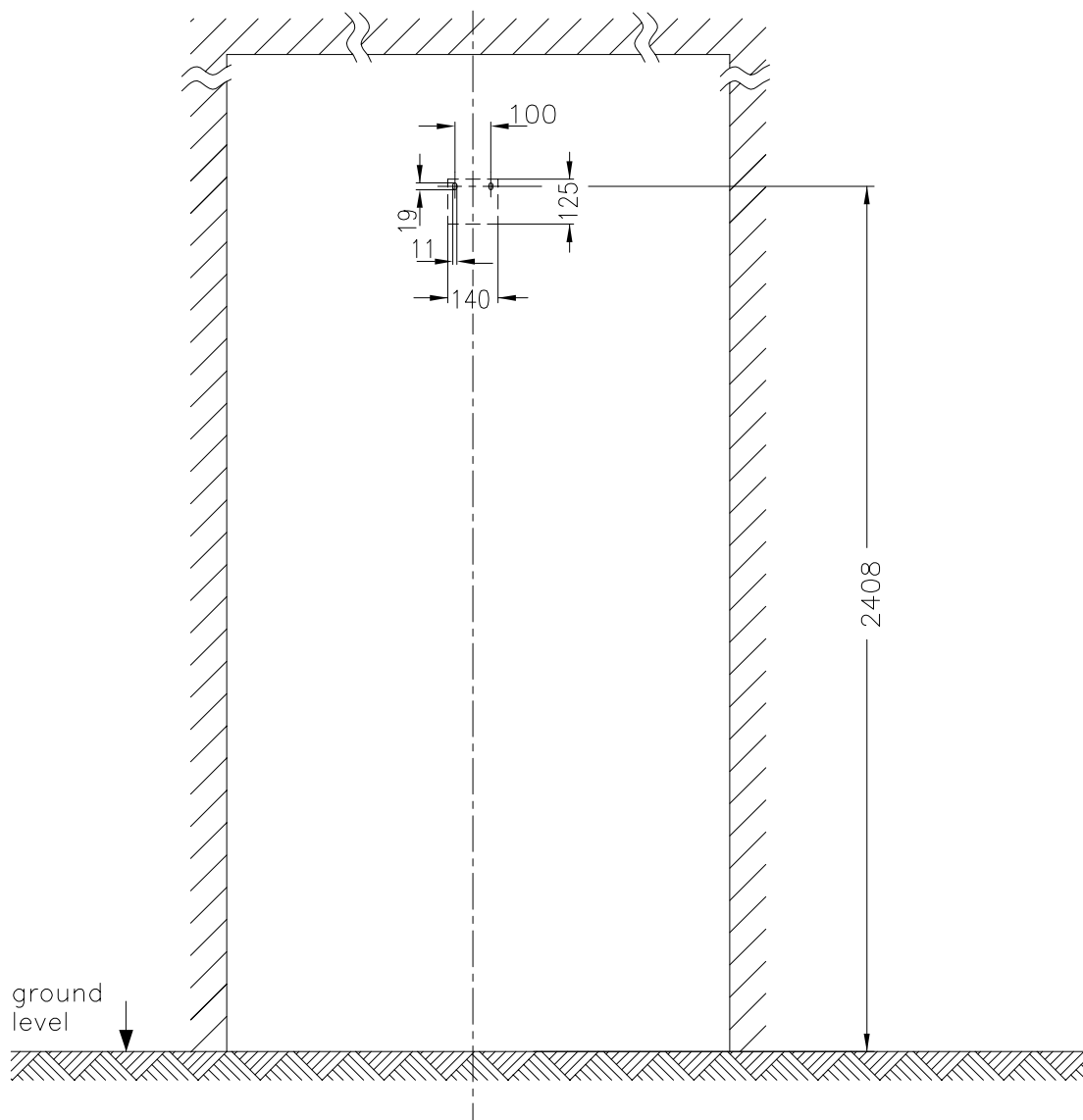
242

795

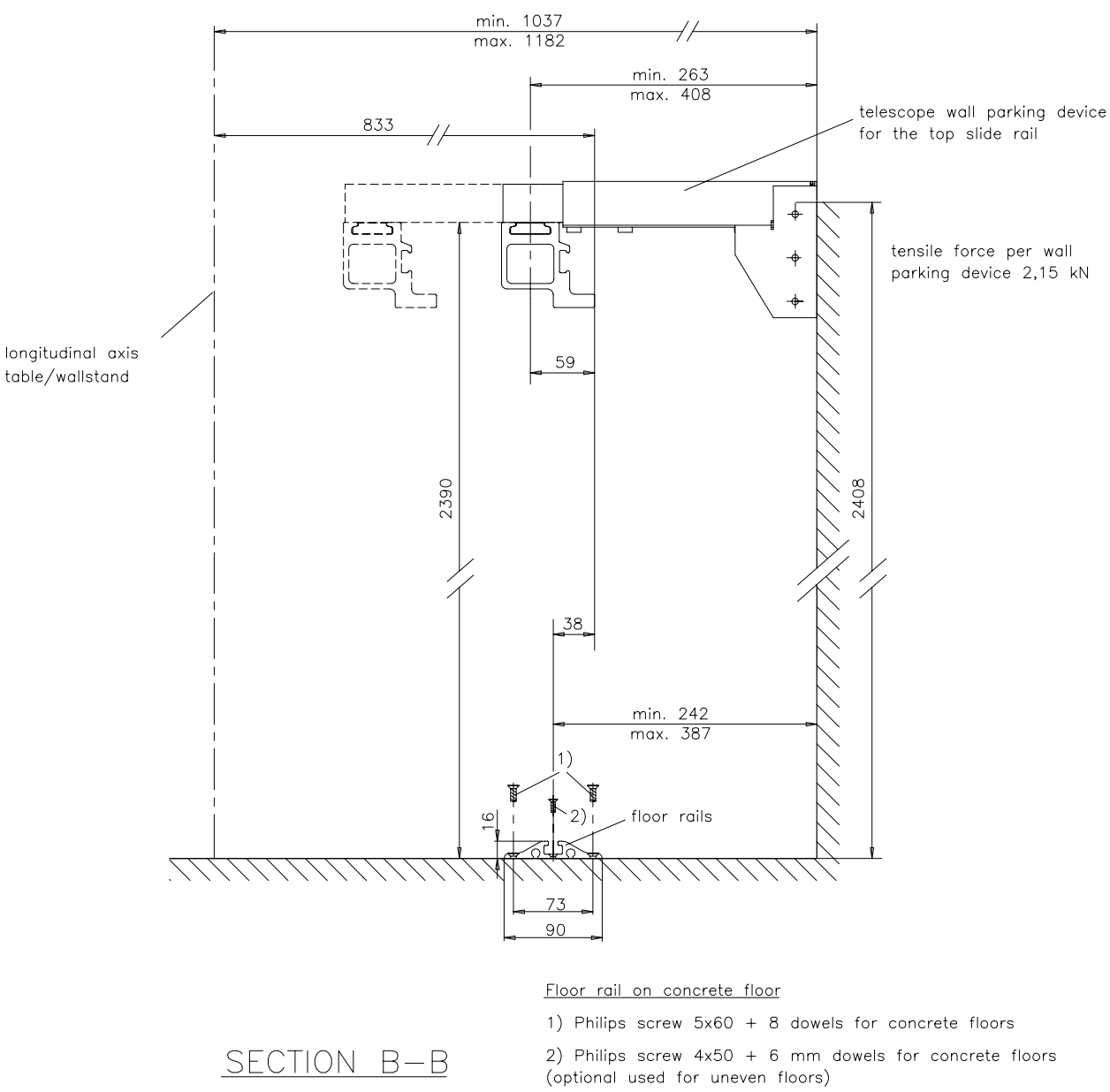
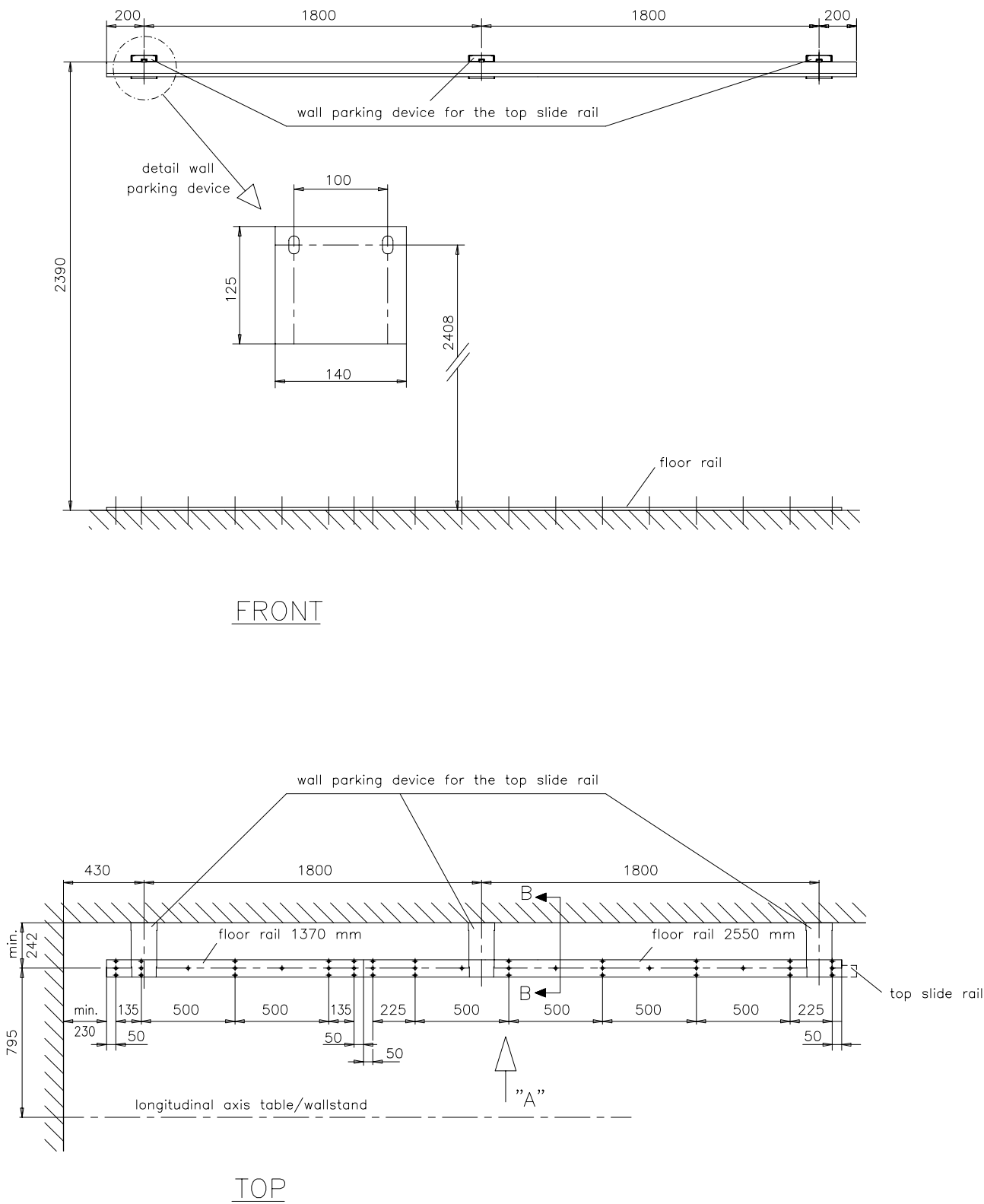


BuckyDiagnost FS Compact
Version for ceiling height
from 2798 to 3400 mm
Mechanical dimensions

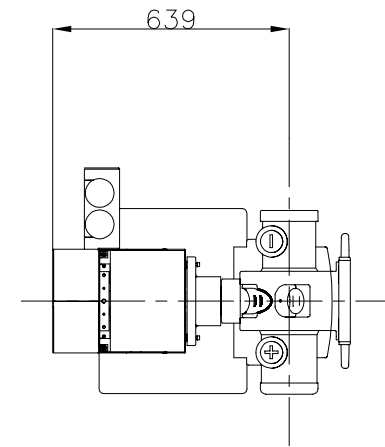
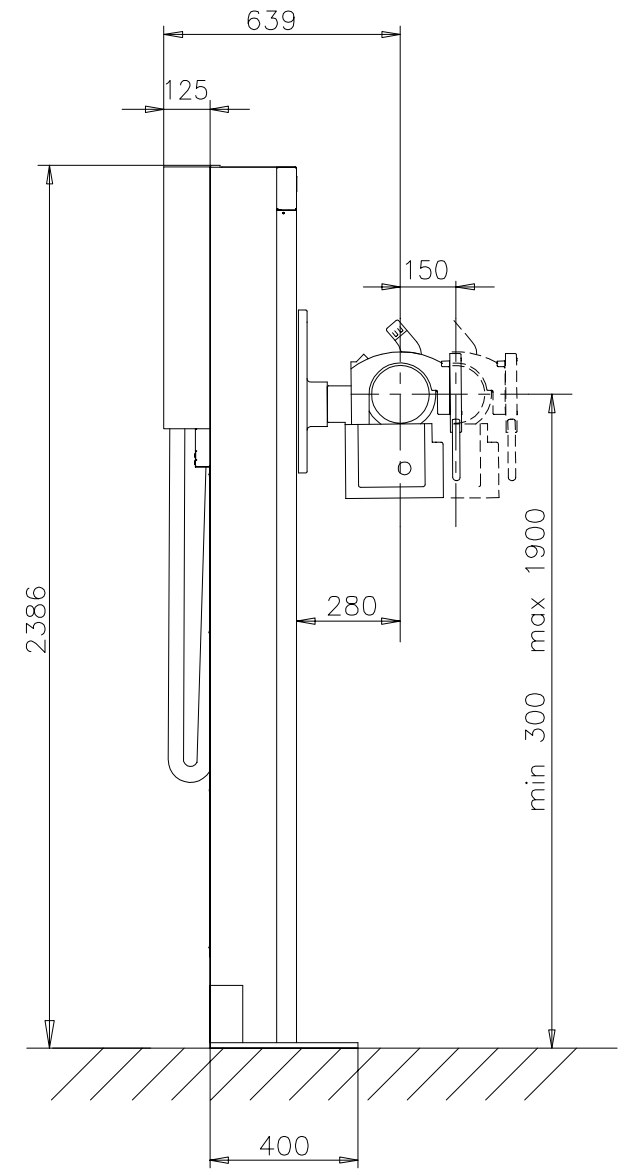
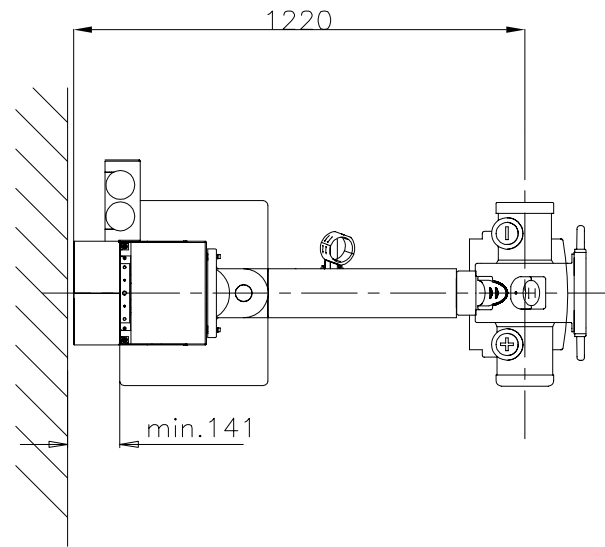
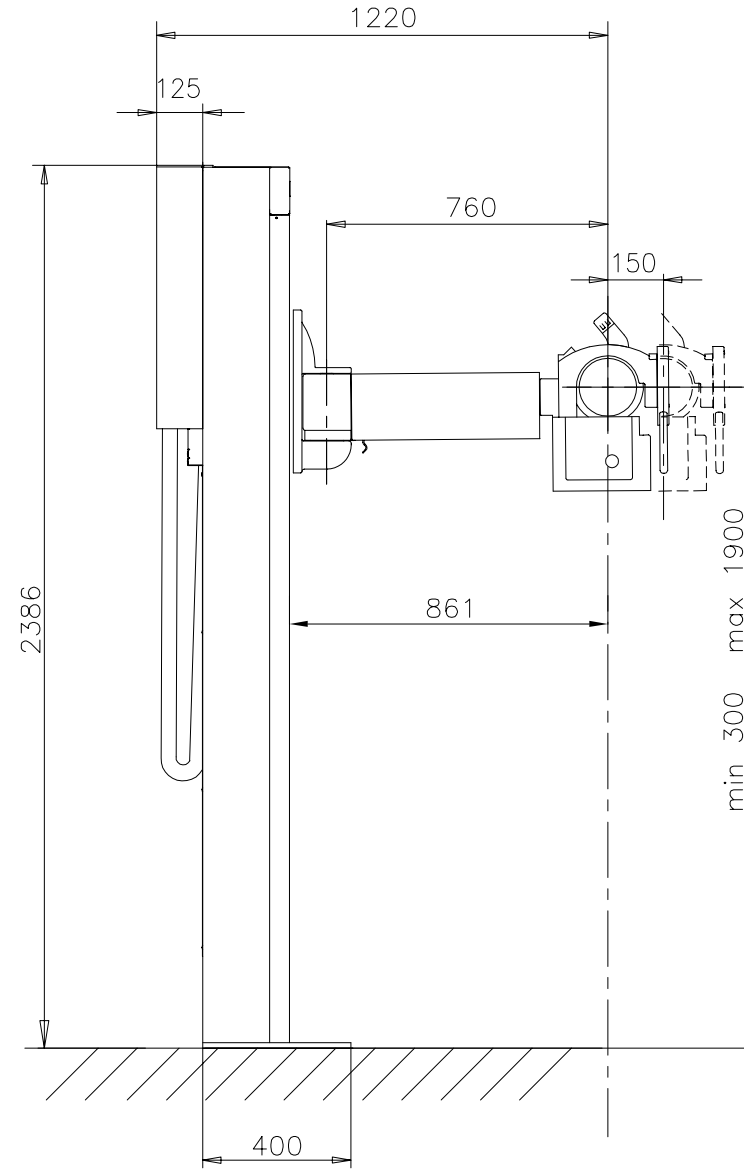
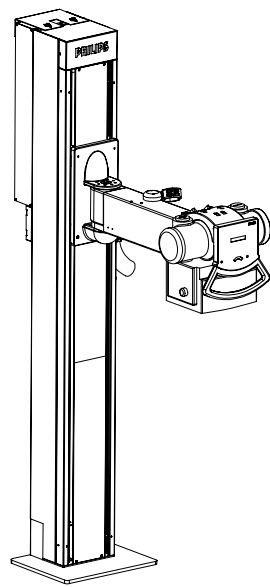
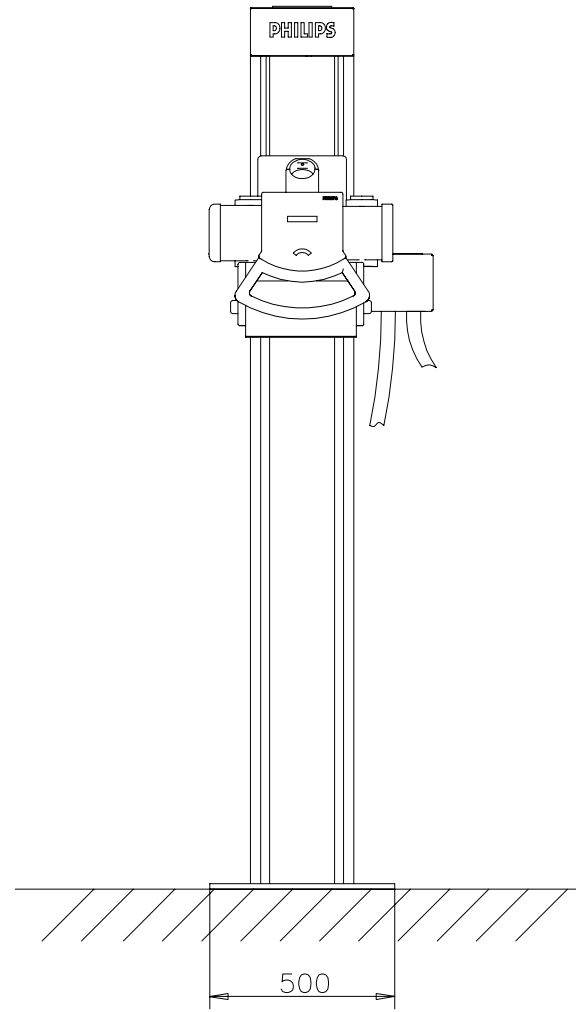




BuckyDiagnost FS Compact
Wall holder wall fixing
Mechanical dimensions



BuckyDiagnost FS
compact version
Detail attachment



BuckyDiagnost FS Fix
with short or long arm
Mechanical dimensions

A1 03-09-11_Ost.
451298201381_z4_031

4512 982 0138.
© Philips Medical Systems

(03.1)

400

500

Product Planning Data

wall

165 ...225

180

29

280

180

80

83

48

18

Base longitudinal centerline

front/operator side

fixed by 3x M8

cable
outlet

concrete
fixed by 3 x M8
plate
column
concrete
(class \geq B25)
95mm
(3.74")
safety bolts
type LIEBIG
superplus BLS 14/80/30
 $\varnothing 14\text{mm}$
(0.55")

0 50 100
mm

steelplate
fixed by 3 x M8x50mm

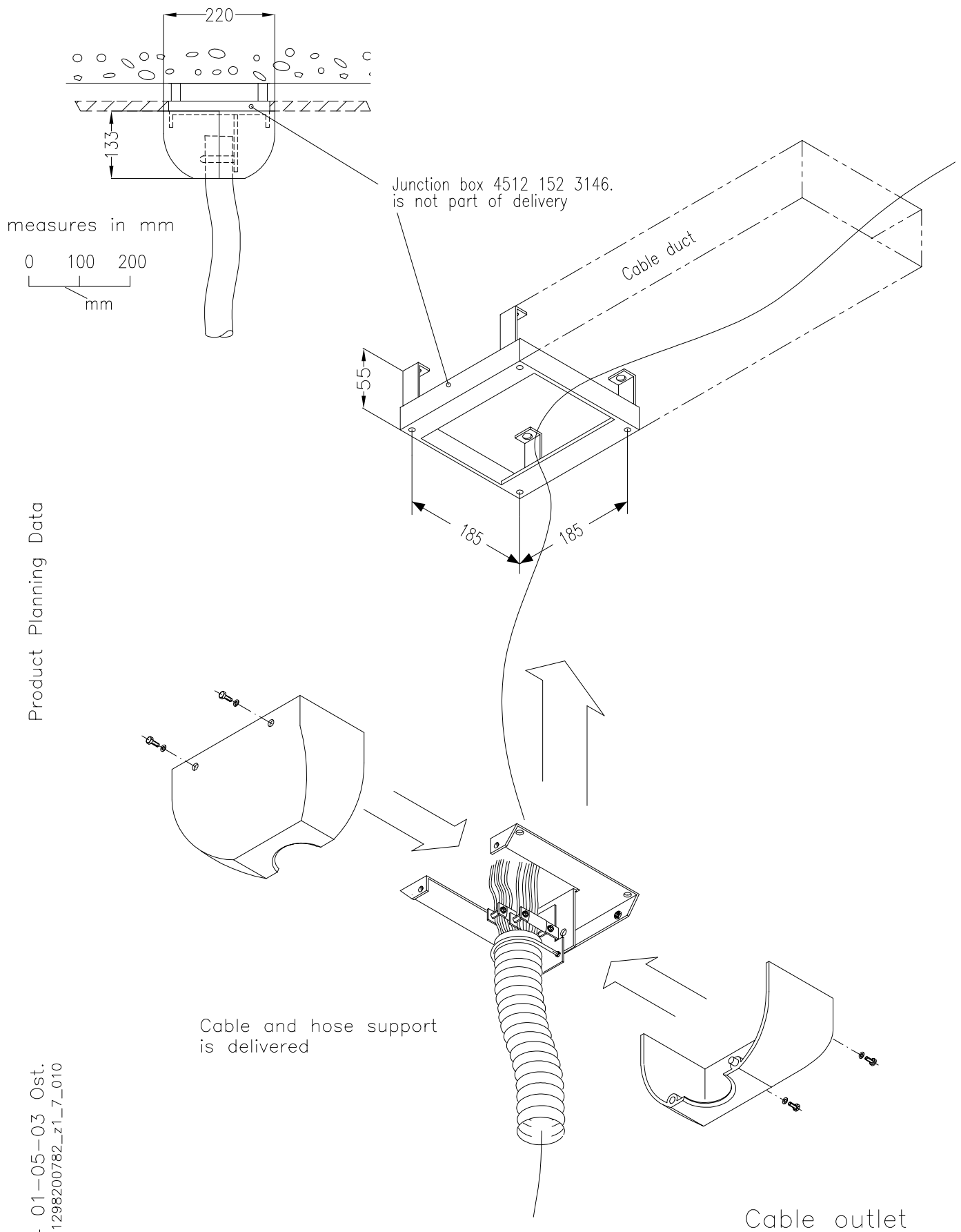
column
steelplate
thickness $\geq 15\text{mm}$

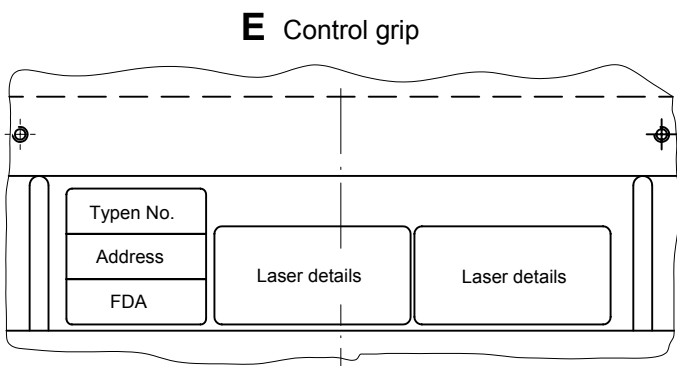
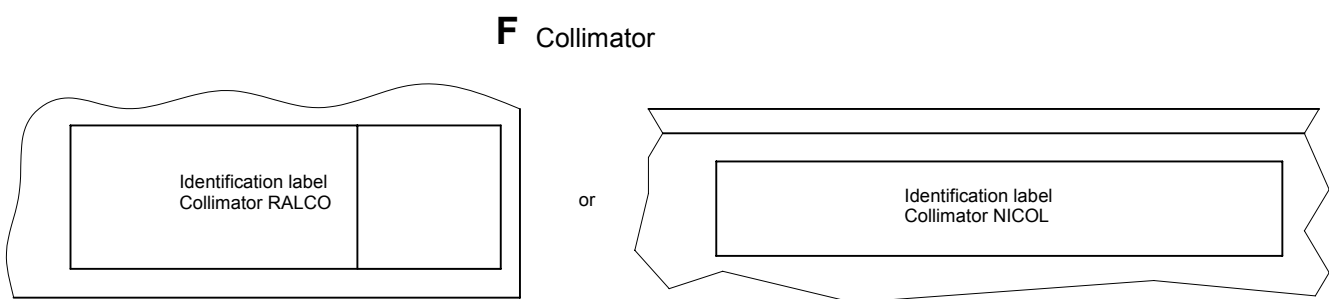
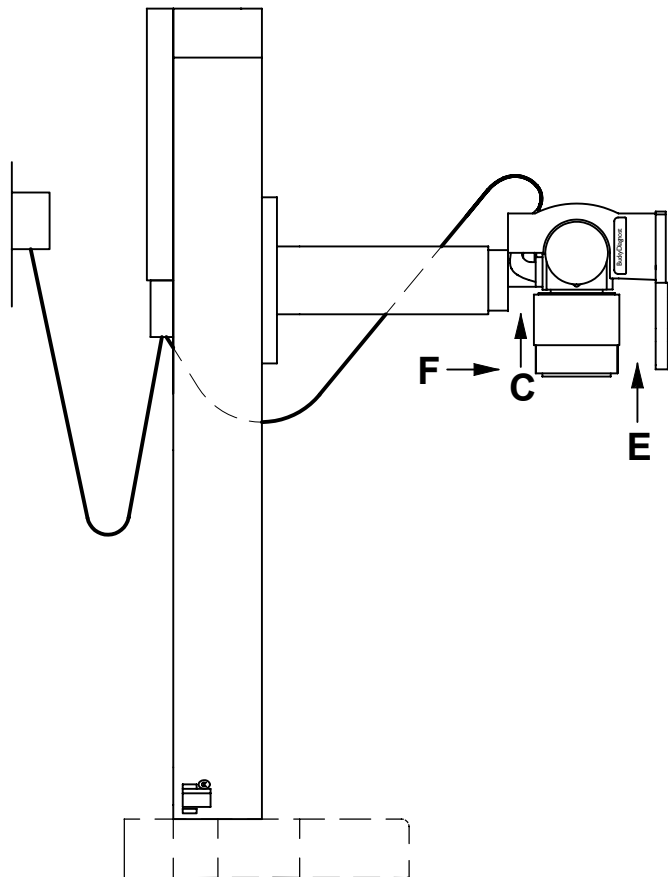
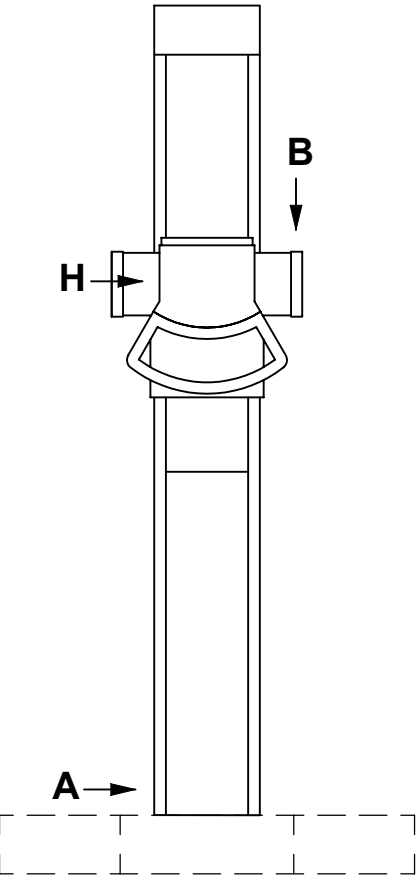
0 50 100
mm

0 50 100
mm

BuckyDiagnost FS Fix
Column
Template

Z-4

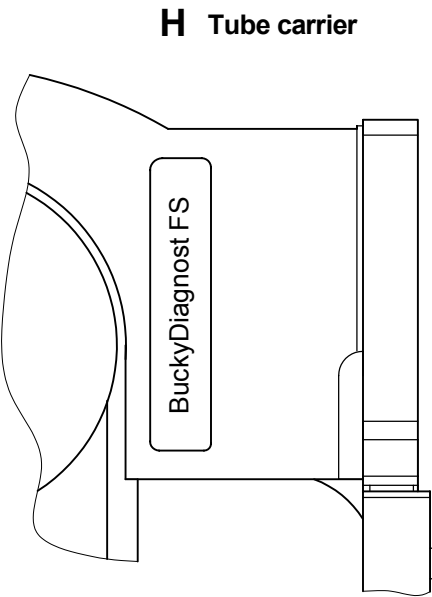
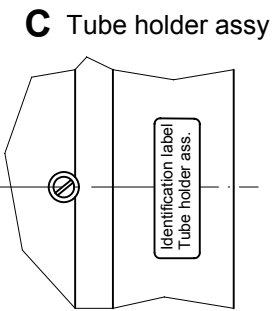
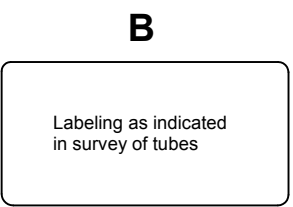




A System labels

CE	
UL / CSA	
Logo	Address
Typen No.	Electr. data
IEC 60601-1	IEC 60601-2-32

Identifications label
Stand FS



BuckyDiagnost FS
Labelling

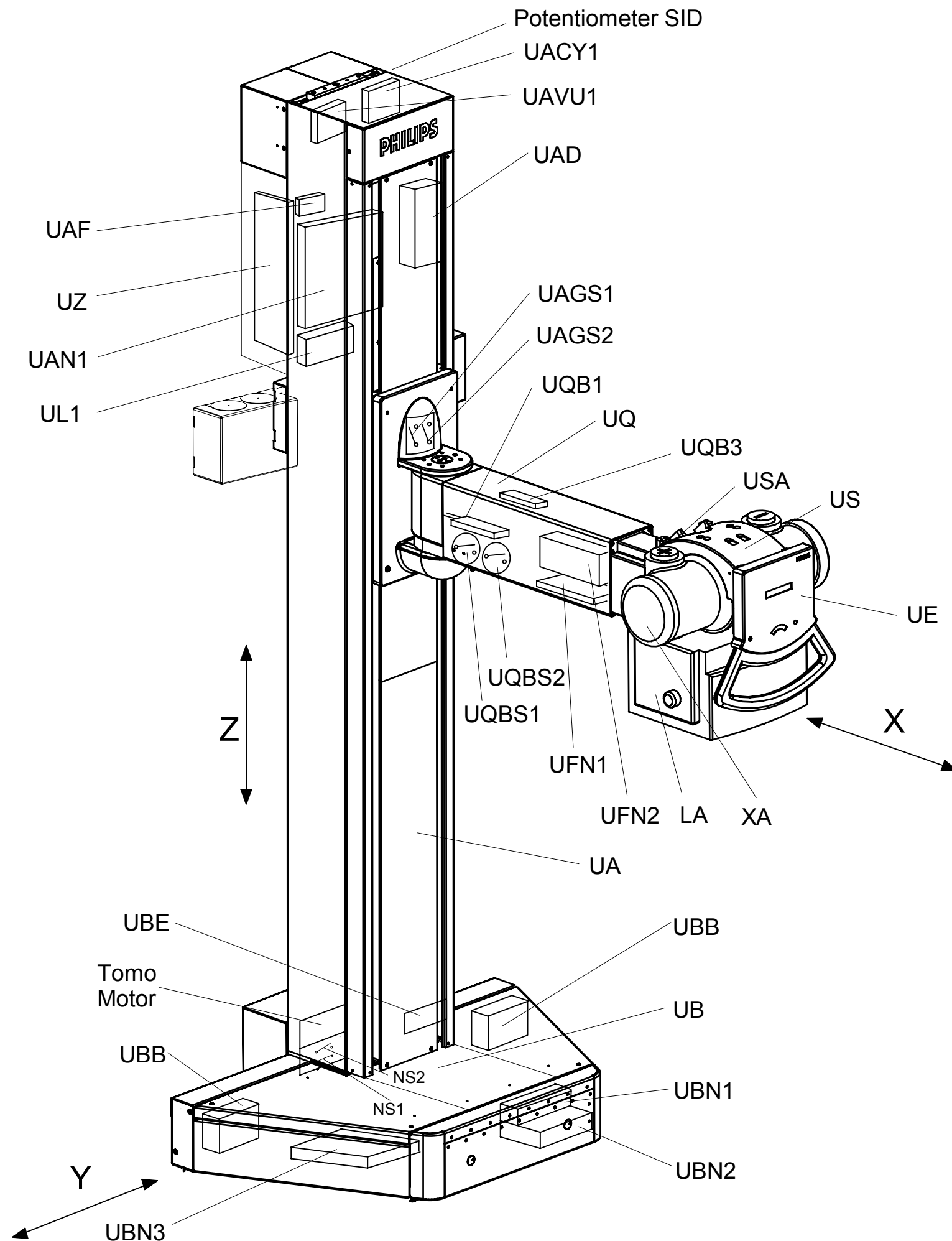
Schematic diagrams

FS Standard / Compact / Fix electrical

BuckyDiagnost FS Standard Survey of units	Z1-1
BuckyDiagnost FS Compact Survey of units	Z1-1.1
BuckyDiagnost FS Fix Survey of units	Z1-1.2
BuckyDiagnost FS Power supply UAN 1	Z1-2
BuckyDiagnost FS Standard / Compact without options	Z1-3.1
BuckyDiagnost FS Standard / Compact with sensing system cabling	Z1-3.2
BuckyDiagnost FS Standard / Compact with sensing, tracking system cabling	Z1-3.3
BuckyDiagnost FS Standard with tomo system cabling	Z1-3.4
BuckyDiagnost FS Standard with tomo sensing system cabling	Z1-3.5
BuckyDiagnost FS Standard with tomo, tracking, sensing system cabling	Z1-3.6
BuckyDiagnost FS Fix without sensing	Z1-3.7
BuckyDiagnost FS detailed schematic	Z1-4
BuckyDiagnost family control handle and automatic collimator Nicol	Z1-5
BuckyDiagnost FS Standard, Tomo power supply and safety circuit	Z1-6

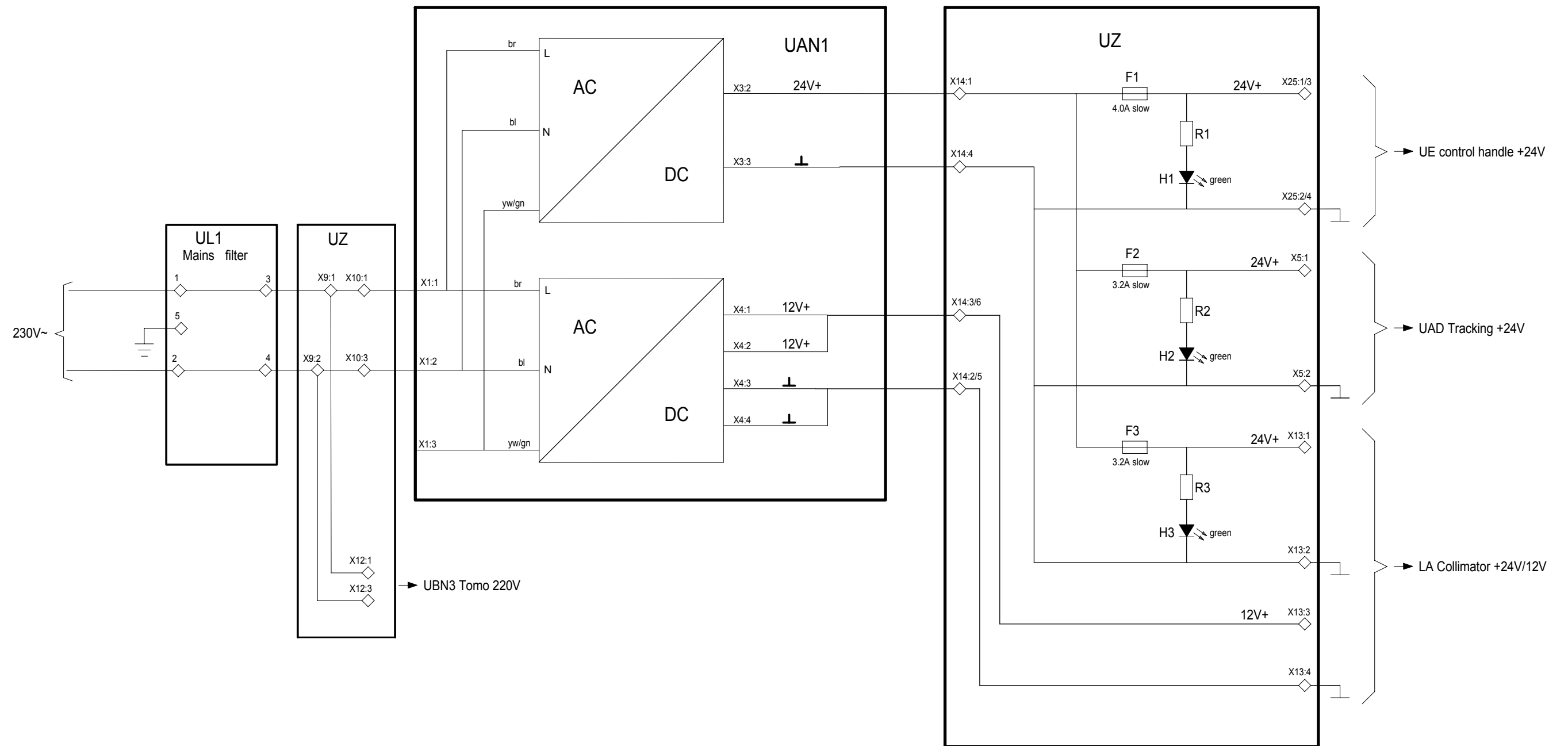
Wiring diagrams

BuckyDiagnost FS Earthing diagram	Z2-1
BuckyDiagnost FS Wiring diagram	Z2-2
BuckyDiagnost FS CAN bus cable	Z2-3
BuckyDiagnost FS Standard tomo drive longitudinal wiring diagram	Z2-4.1
BuckyDiagnost FS Standard tomo drive alpha wiring diagram	Z2-4.2
BuckyDiagnost FS tracking wiring diagram	Z2-4.3
BuckyDiagnost family control handle standard	Z2-1.2
BuckyDiagnost family control handle with display and SID laser	Z2-2.2

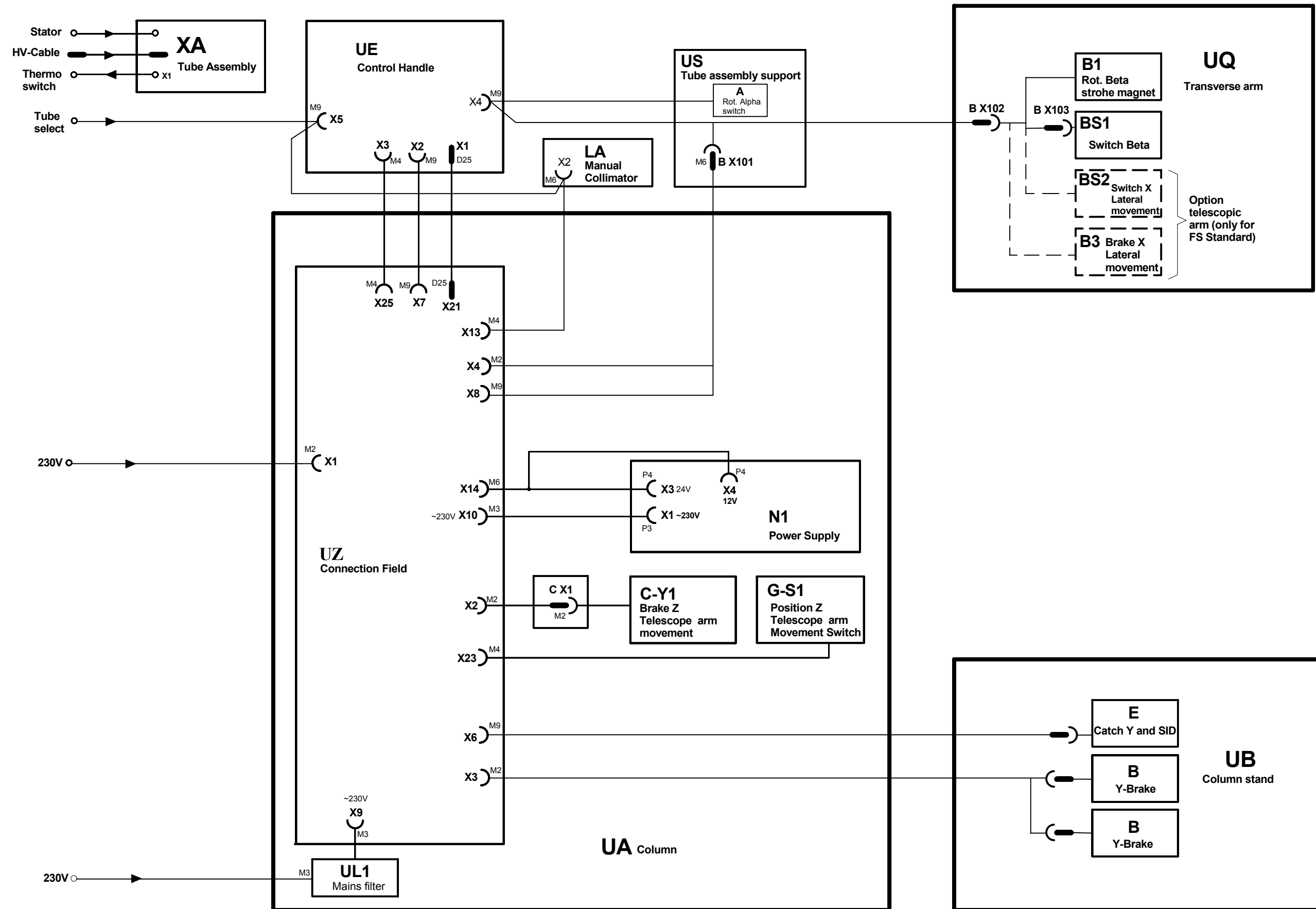


- LA = Collimator
- NS1 = Tomo safety (head and foot end)
- NS2 = Tomo longitudinal centered
- UA = Column
- UAC1 = Brake telescope movement (z-direction)
- UAD = Tracking controller
- UAF = Vertical position sensor (z-direction)
- UAGS1 = Switch vertical SID position (z-direction)
- UAGS2 = Switch Tomo working position (z-direction)
- UAN1 = Power supply
- UAVU1 = Tracking motor
- UB = Column stand
- UBB = Brake longitudinal (Y-direction)
- UBE = Catch and SID position switches
- UBN1 = PCB Tomo safety circuit
- UBN2 = Tomo controller longitudinal (Y-direction)
- UBN3 = Tomo power supply
- UE = Control handle
- UFN1 = Tomo controller alpha movement
- UFN2 = Tomo 2 alpha drive
- UL1 = Power filter
- UQ = Transverse/ Telescope arm
- UQB1 = Stroke magnet for beta rotation
- UQBS1 = Switch for beta rotation position
- UQB3 = Brake for lateral movement (x-direction)
- UQBS2 = Position switch for lateral movement (x-direction)
- US = Tube housing support
- USA = Switch for alpha rotation position
- UZ = PCB connection board
- XA = Tube

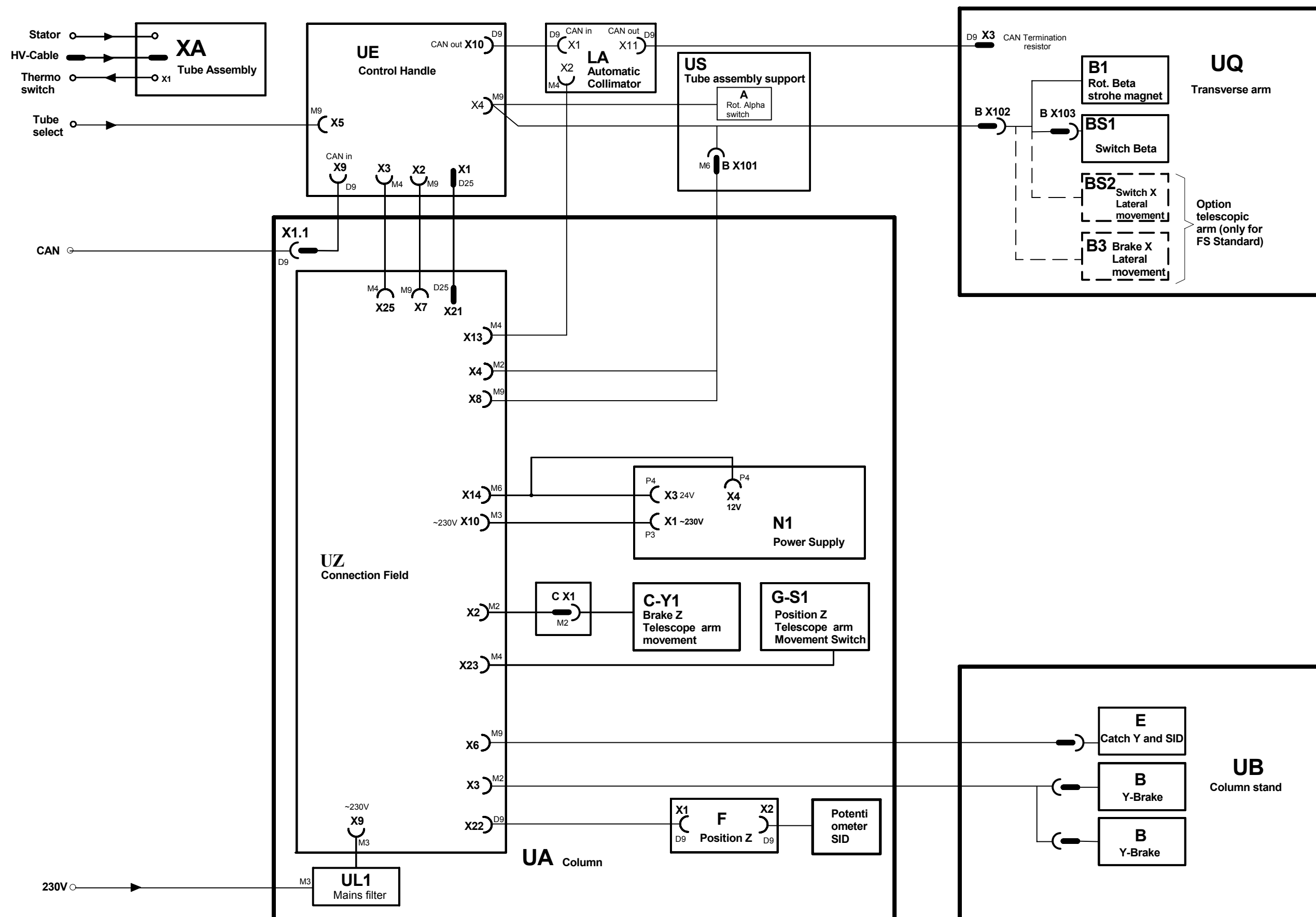
BuckyDiagnost FS
Standard
Survey of units



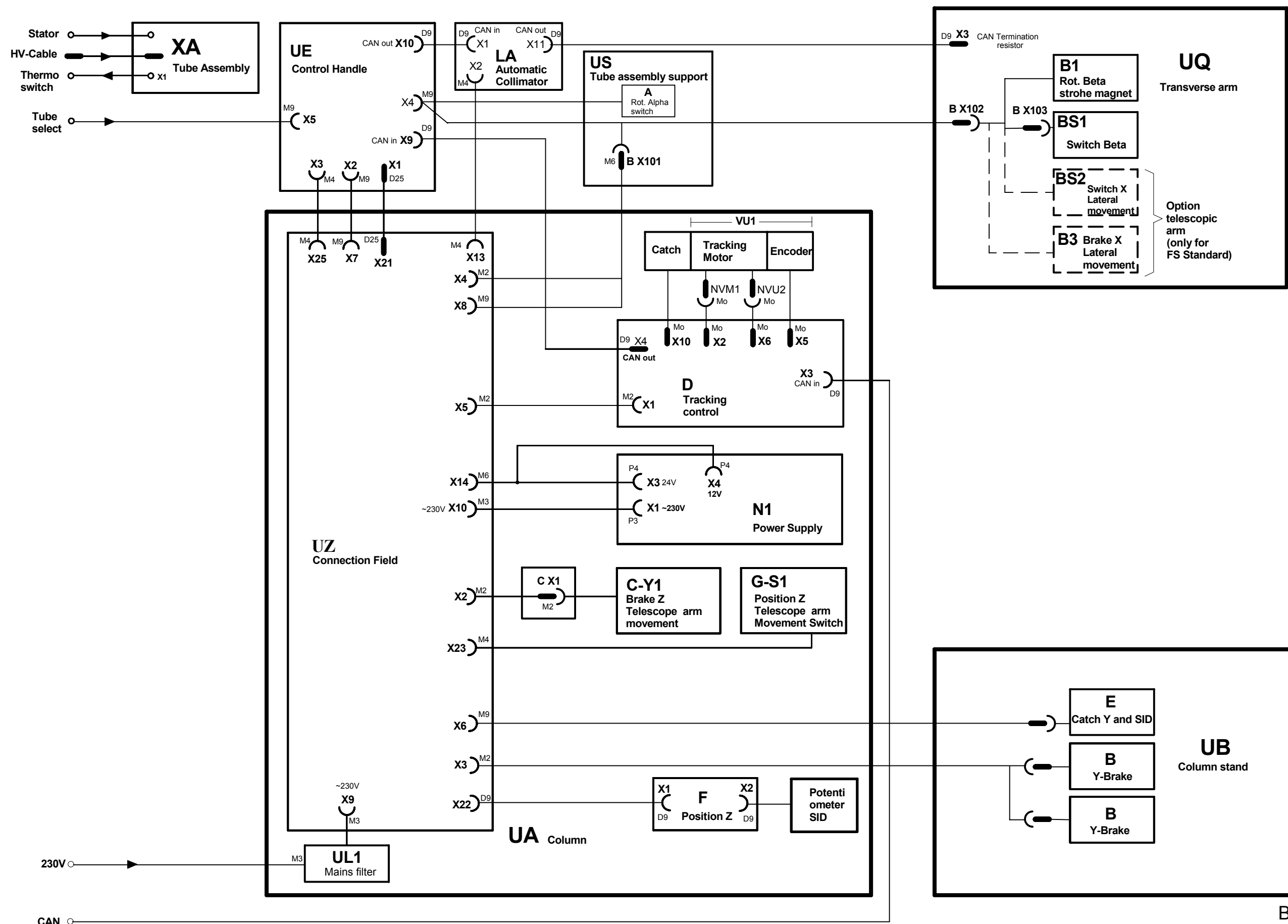
A3 03-12-08 Schr.



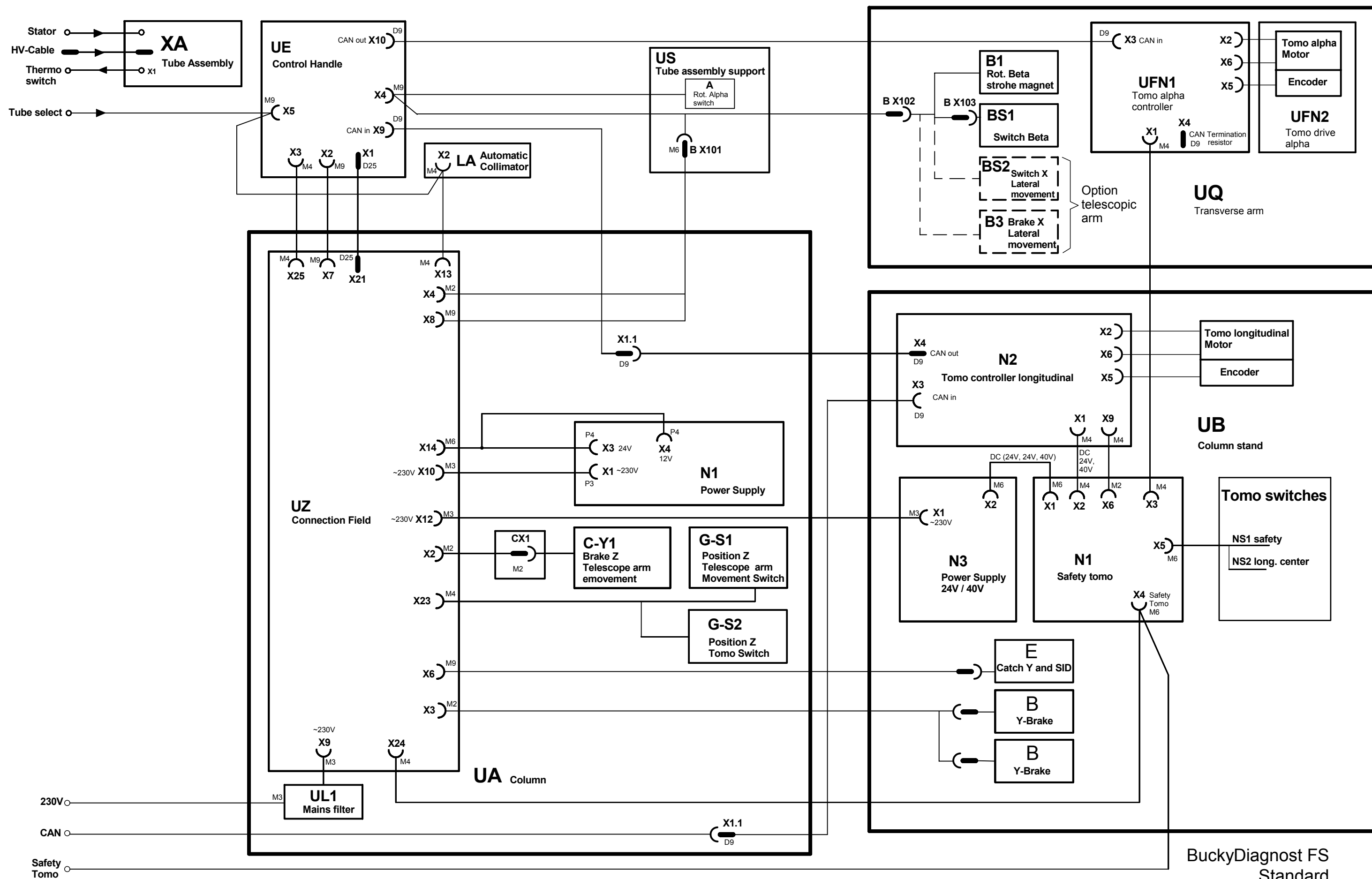
BuckyDiagnost FS
Standard / Compact
without options
System cabling

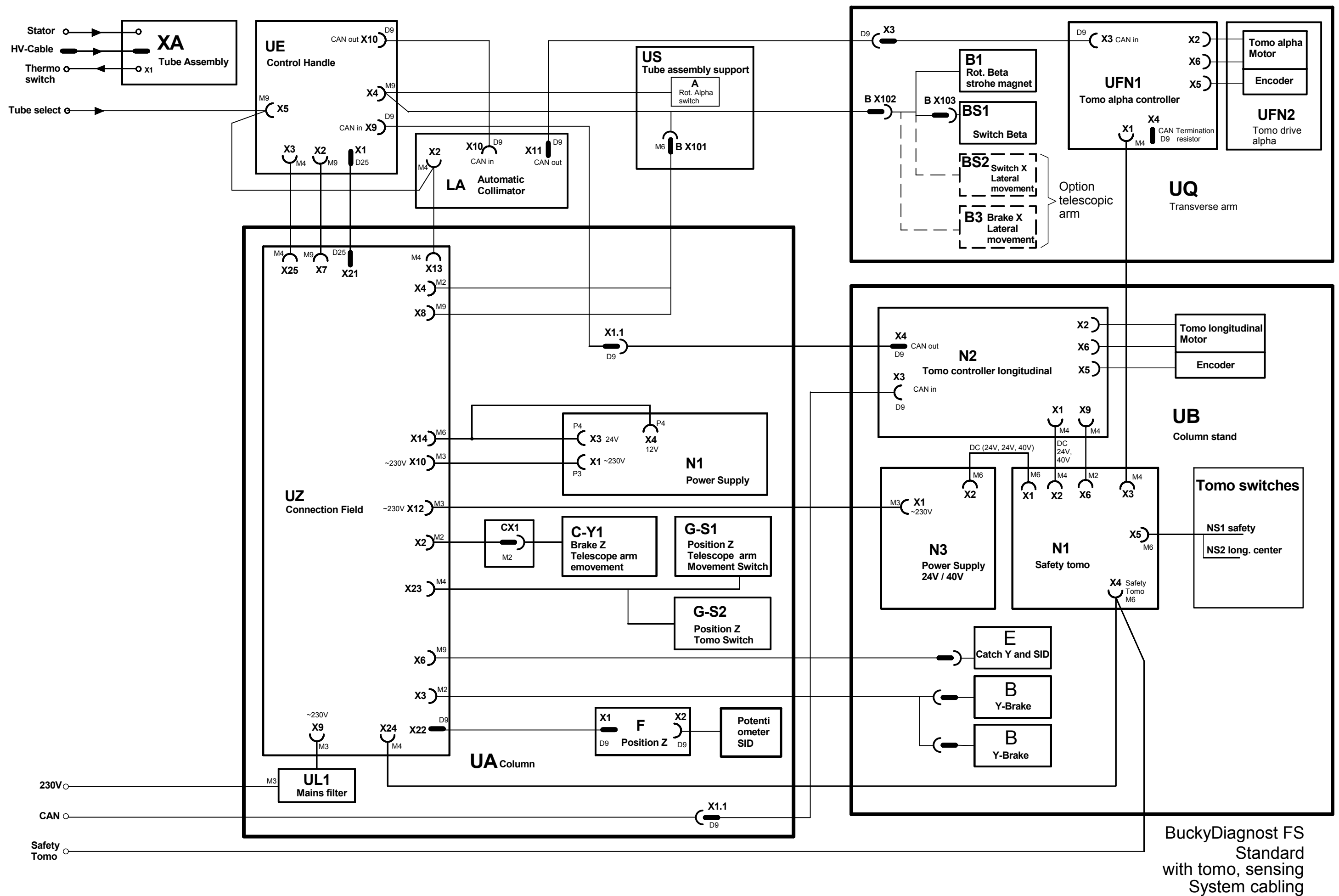


BuckyDiagnost FS
 Standard / Compact
 with sensing
 System cabling

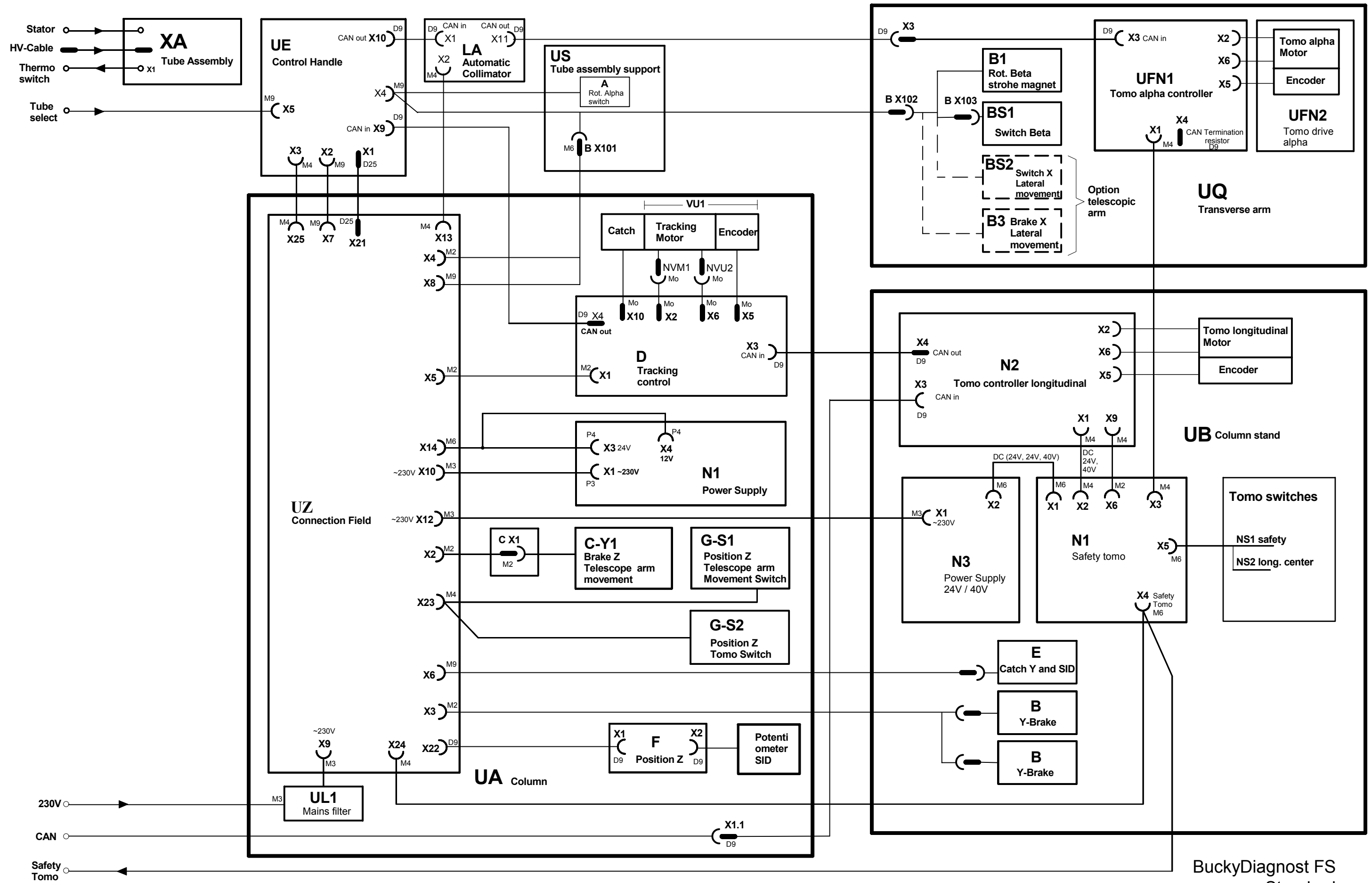


BuckyDiagnost FS
 Standard / Compact
 with sensing, tracking
 System cabling

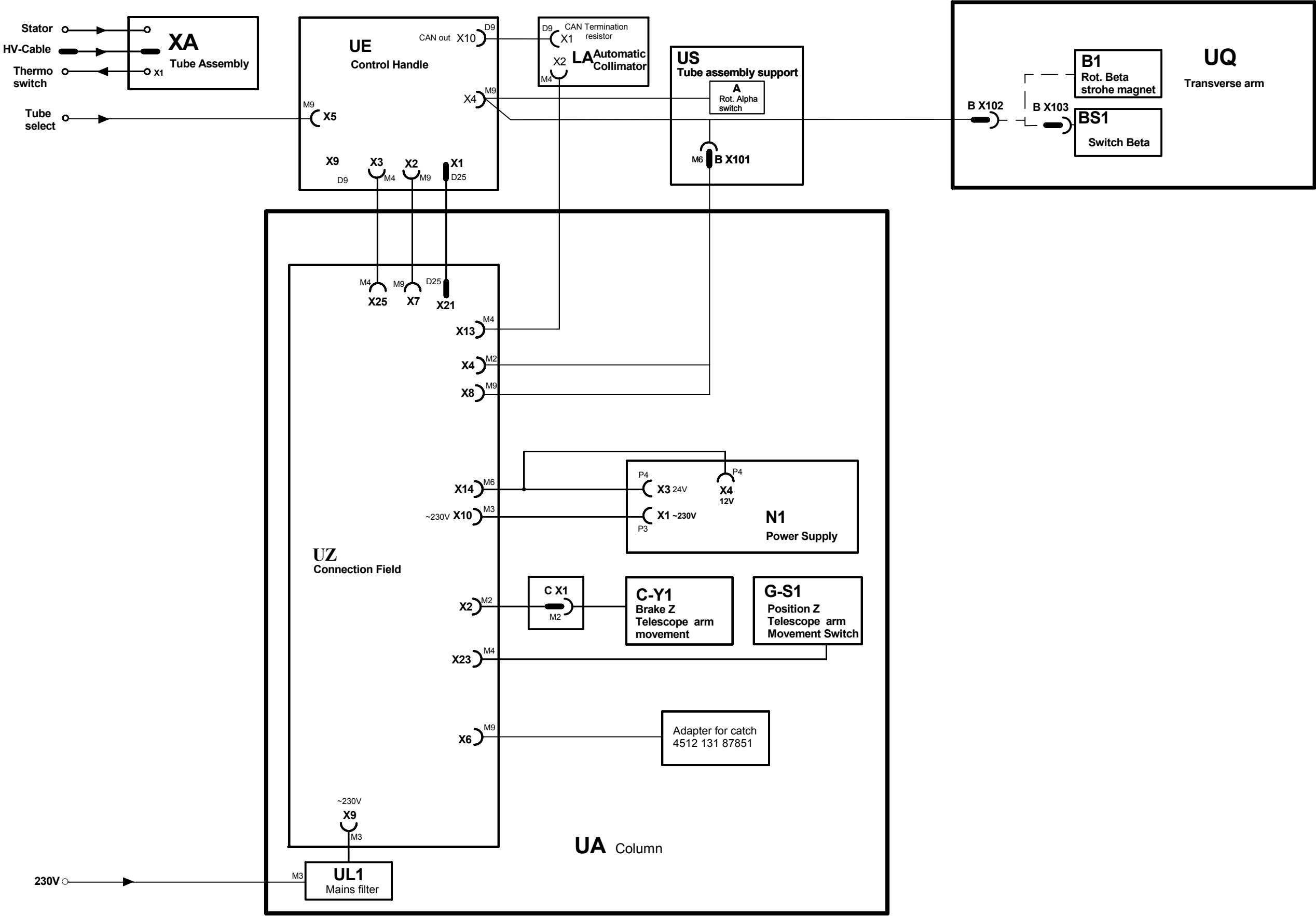




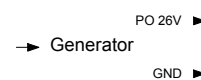
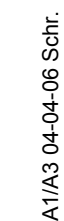
BuckyDiagnost FS
 Standard
 with tomo, sensing
 System cabling

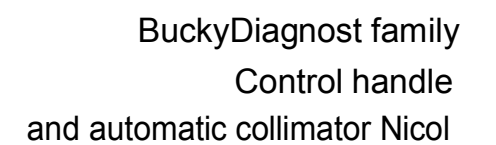


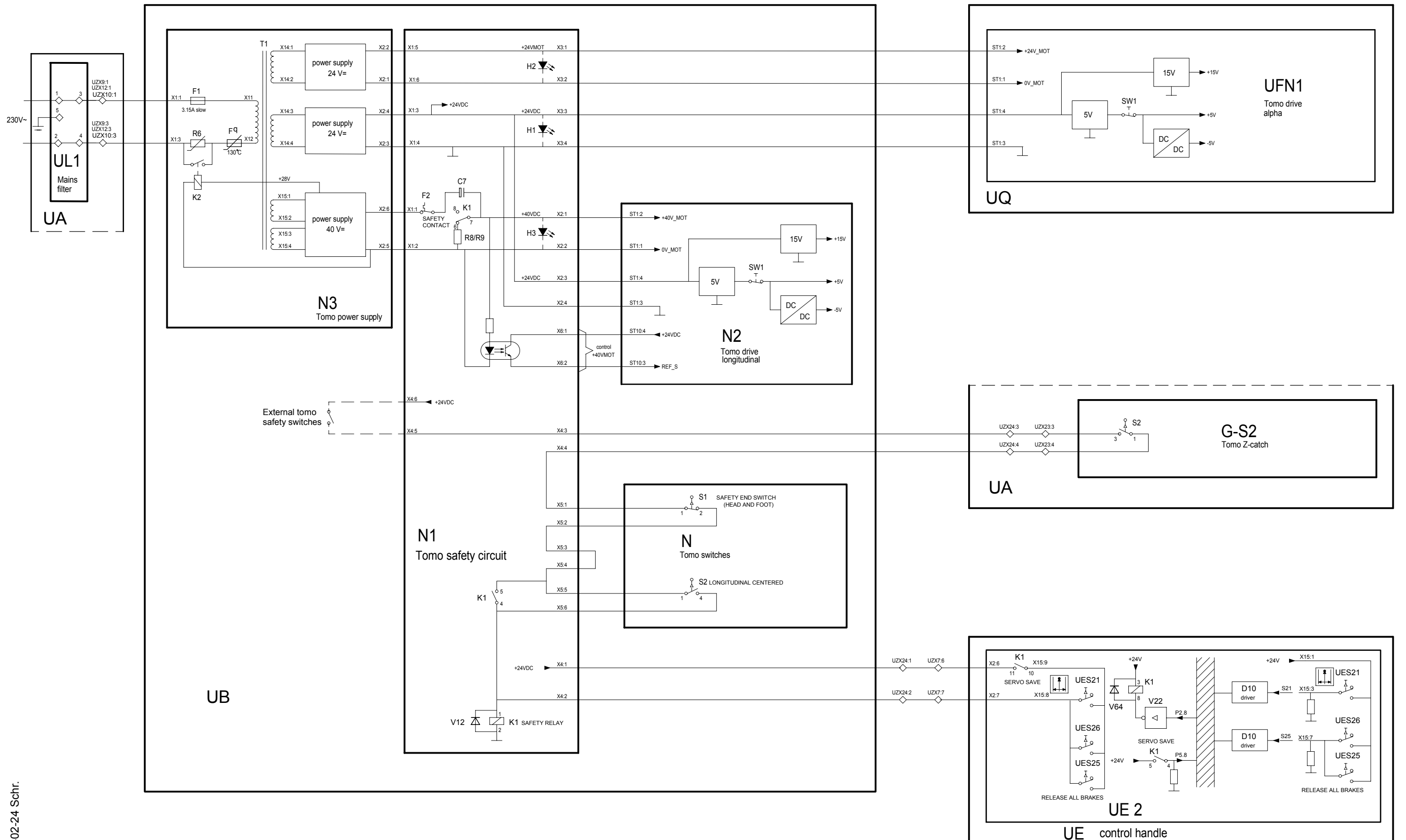
A3 03-12-03 Schr.



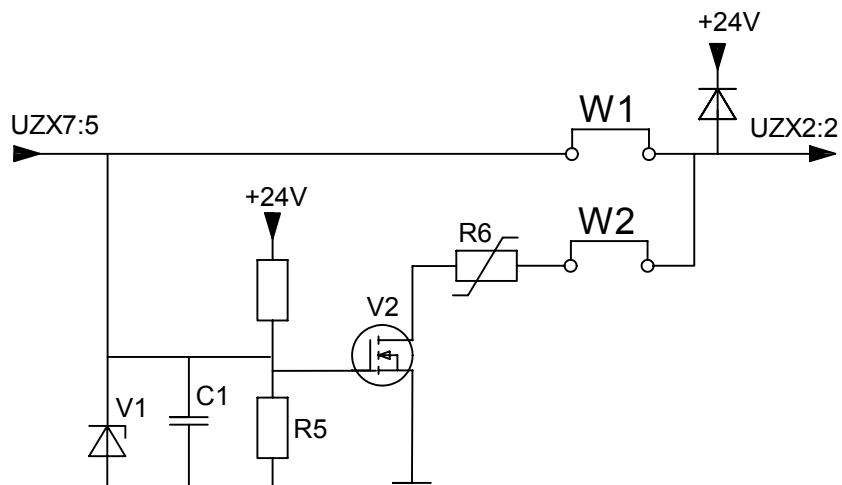
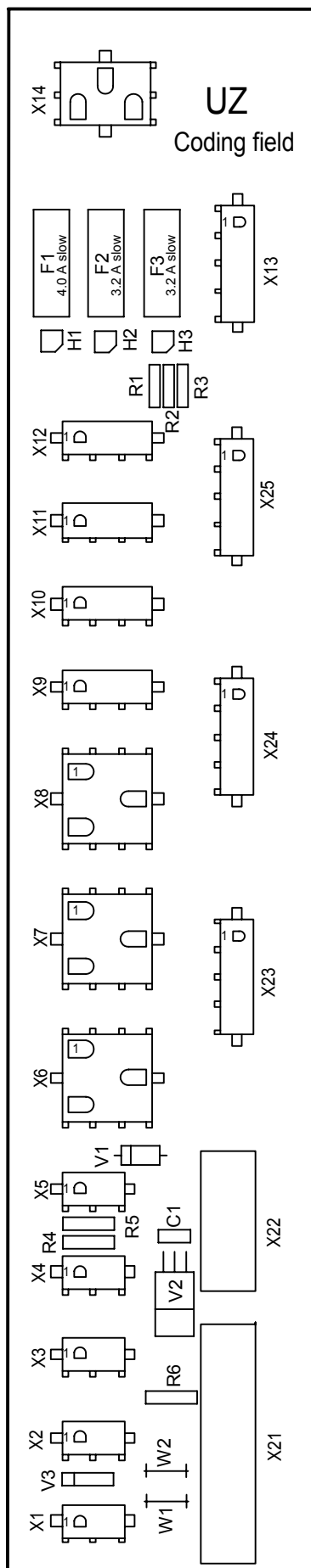
BuckyDiagnost FS
Fix
with sensing
System cabling







BuckyDiagnost FS Standard
Tomo power supply and safety circuit



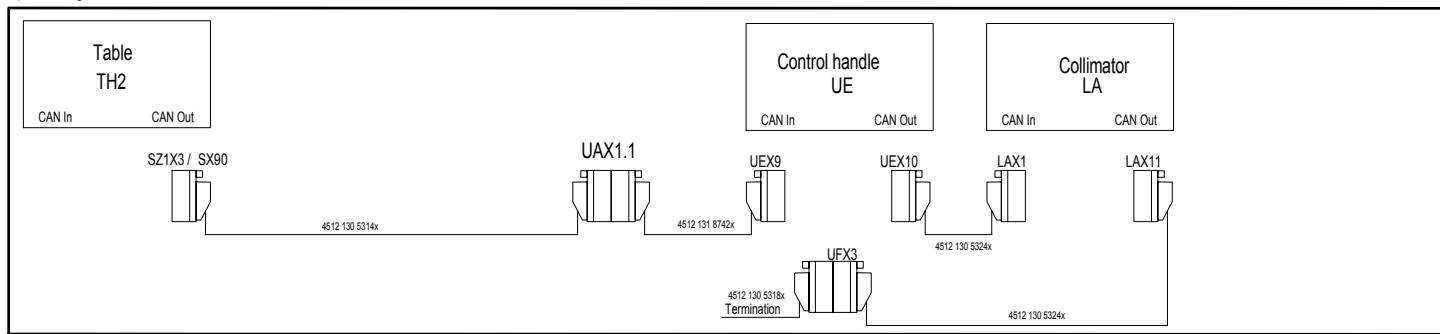
Programming of link W1, W2:

	BuckyDiagnost FS	Bucky Diagnost CS
W1	open	close
W2	close	open

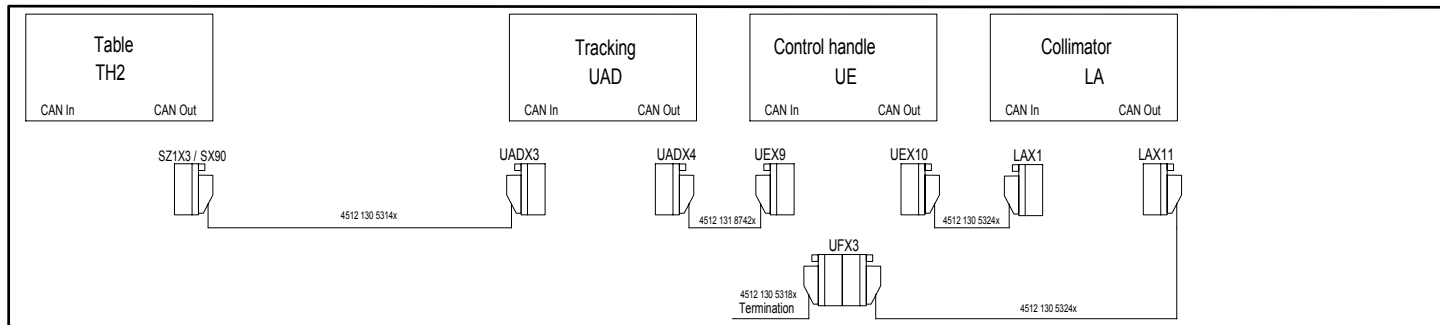
UZ
Coding field
4512 108 0738.

CAN bus cabel connection

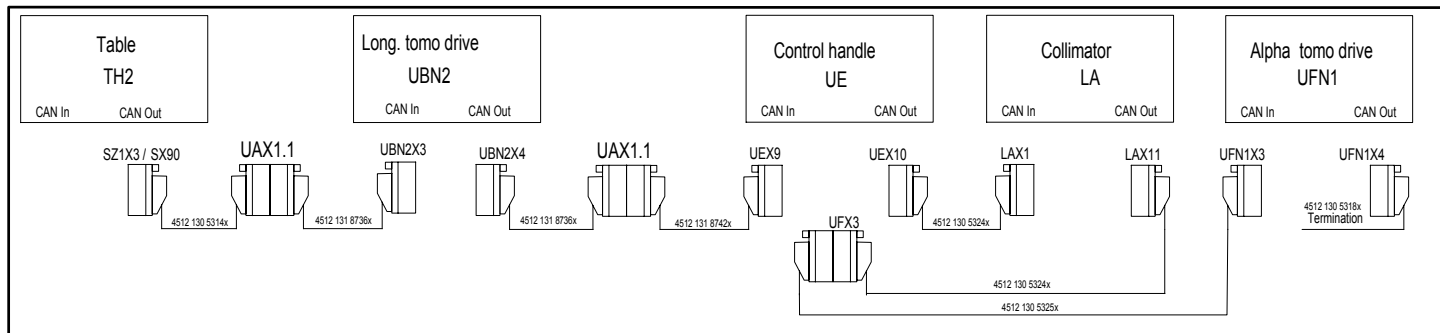
1) Sensing



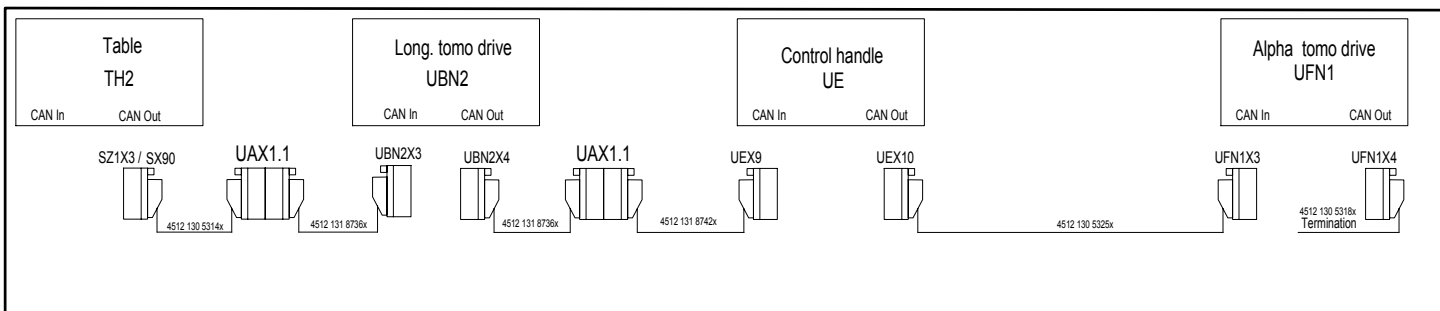
2) Sensing / Tracking



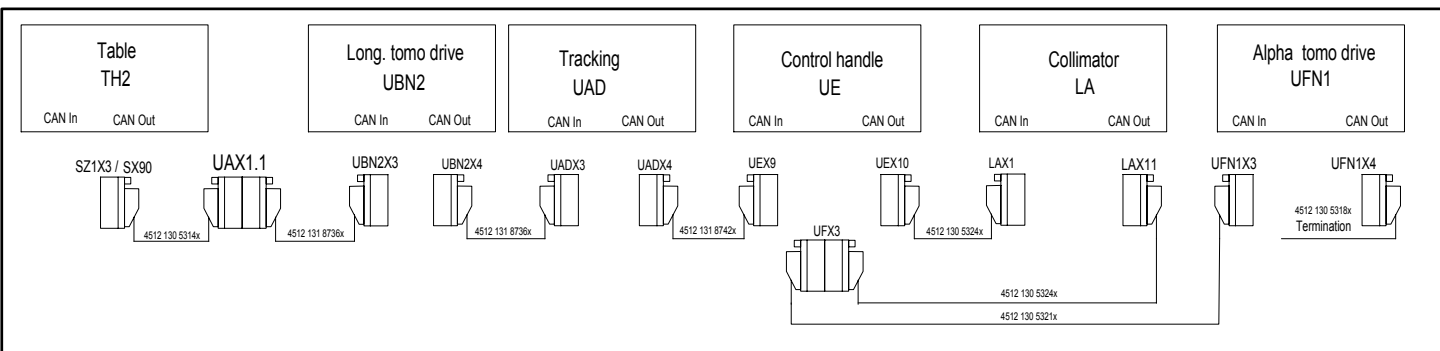
3) Sensing / Tomo



4) Tomo

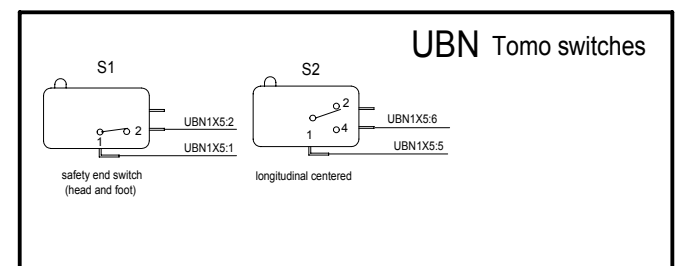
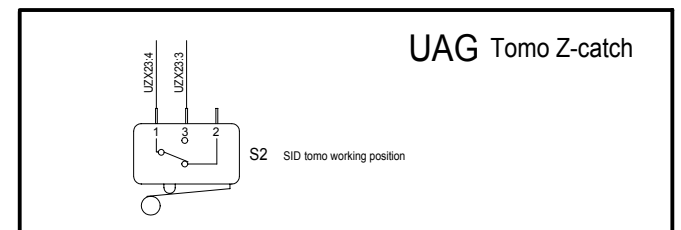
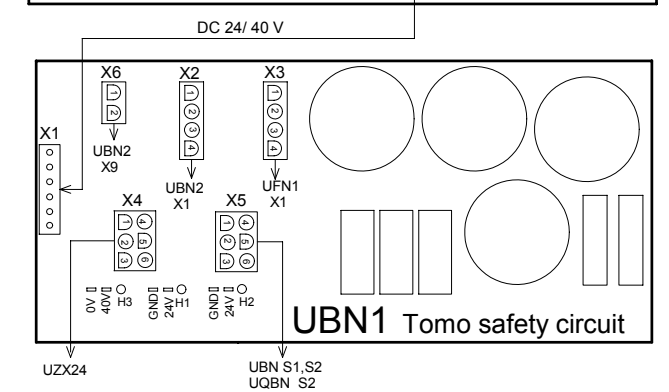
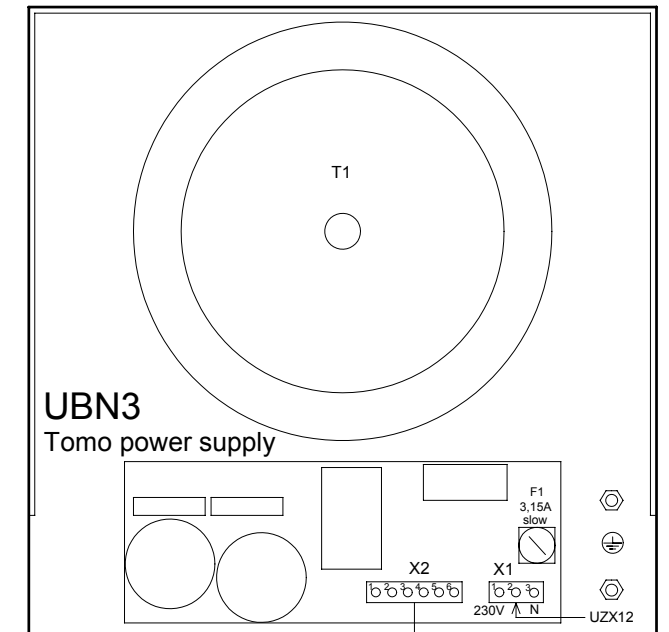
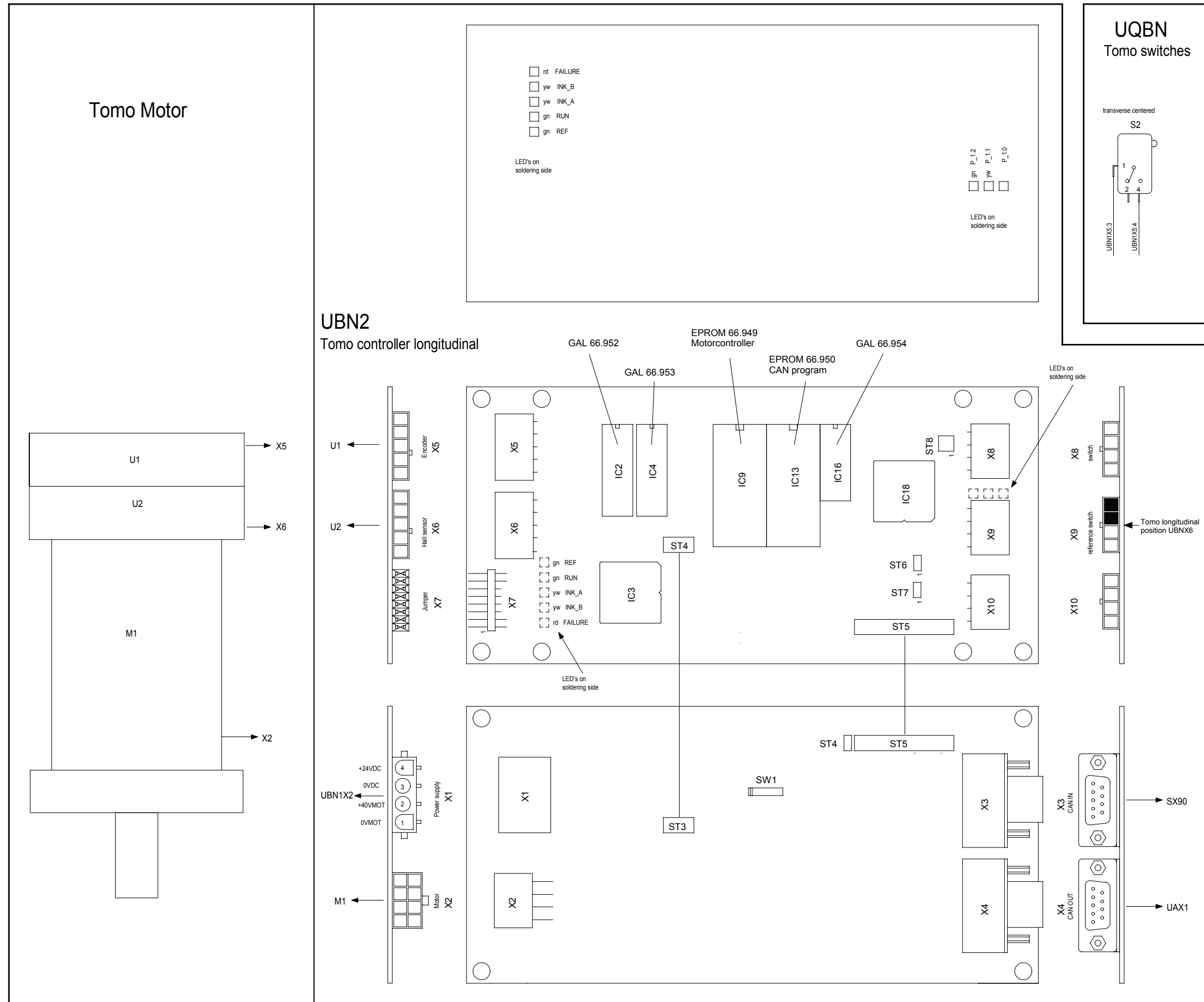


5) Sensing / Tracking / Tomo

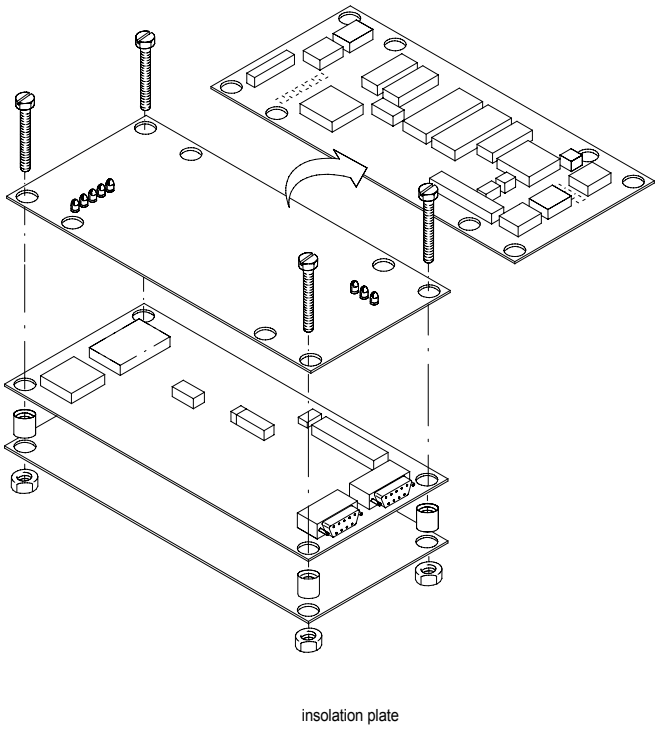
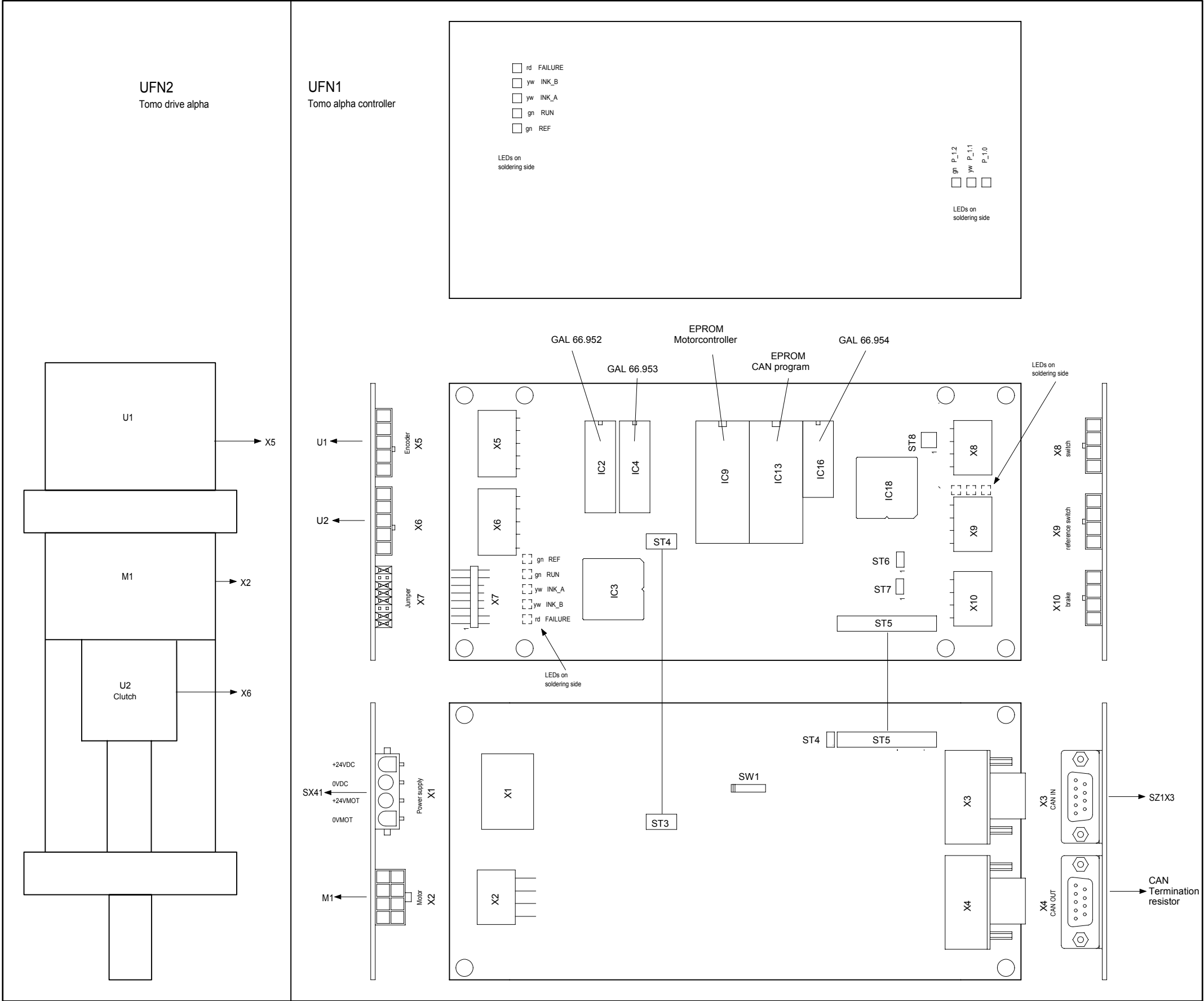


A3/A4 03-06-05 Schr.

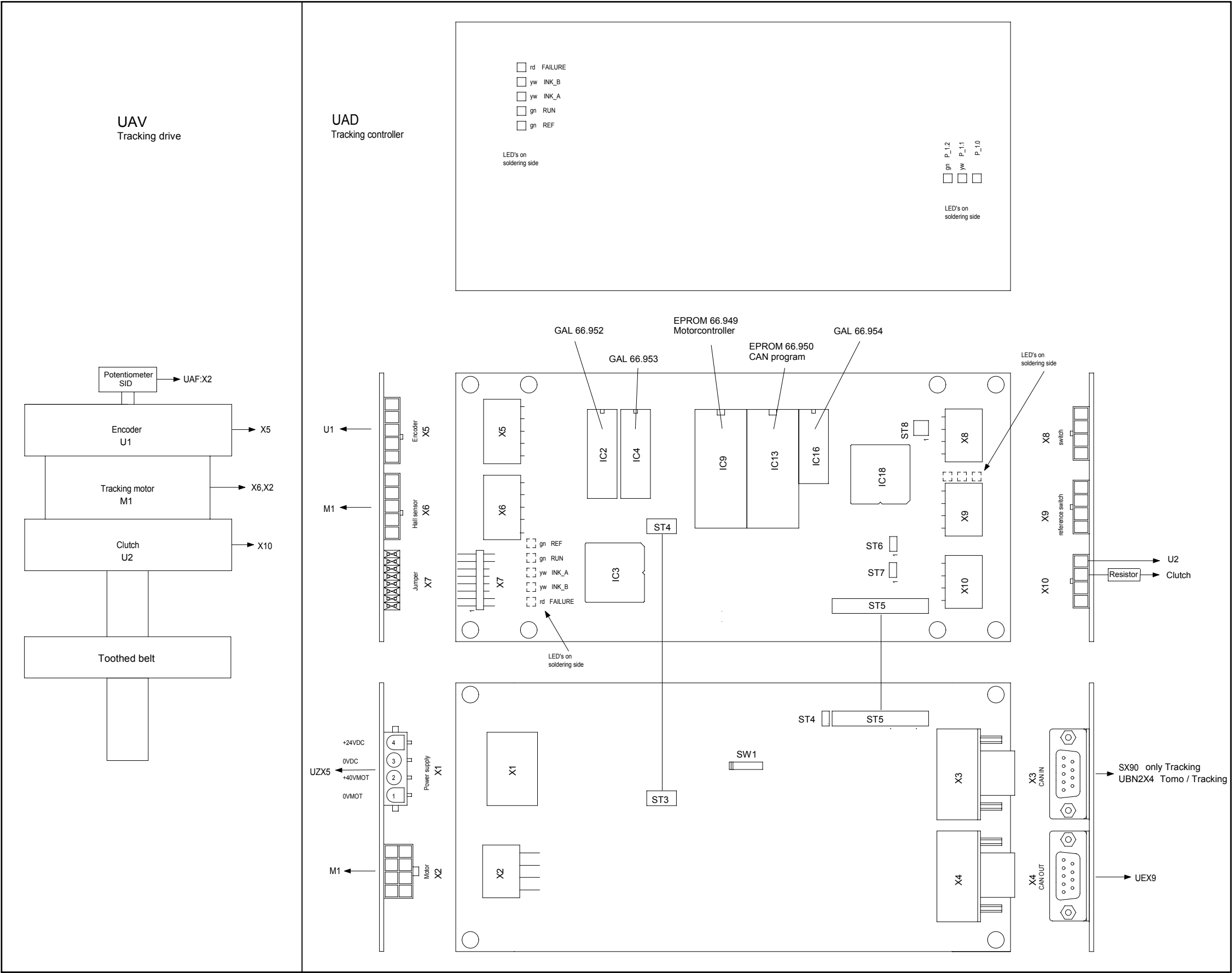
BuckyDiagnost FS
CAN bus cable



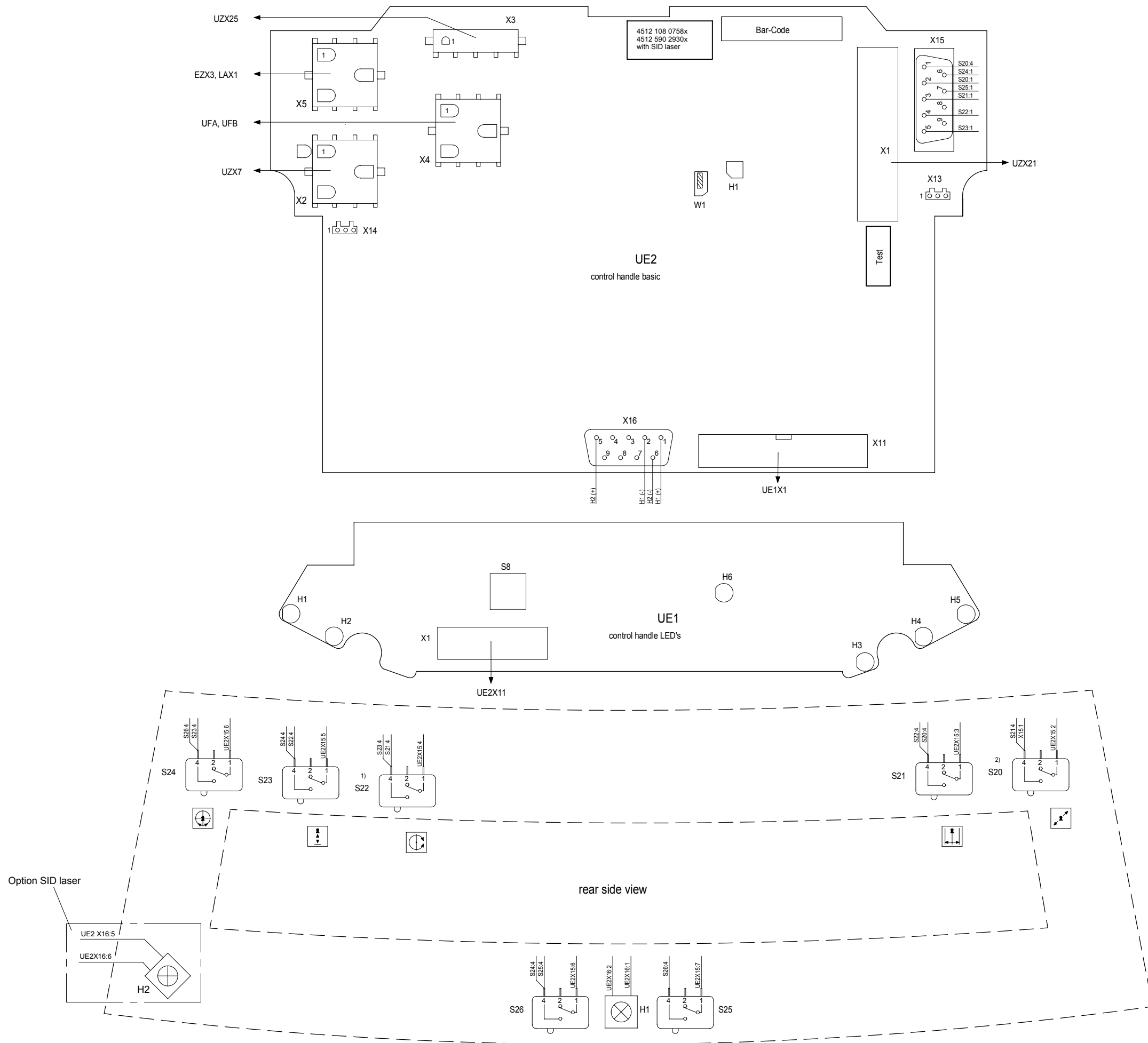
BuckyDiagnost FS
Standard
Tomo drive longitudinal



BuckyDiagnost FS
Standard
Tomo drive alpha
Wiring diagram



BuckyDiagnost FS
Tracking
Wiring diagram



- 1) not used for:
bucky DIAGNOST CE
bucky DIAGNOST trauma
- 2) not used for:
bucky DIAGNOST CE

BuckyDiagnost family
control handle standard

